REPORT RESUMES

ED 019 429 VT 002 069
SIX DECADES OF SERVICE, 1903-1963.
MILWAUKEE SCHOOL OF ENGINEERING, WIS.
REPORT NUMBER MSOE-BULL-16-NO-1 PUB DATE 1 JAN 64
EDRS PRICE MF-$0.50 HC-$3.48 85P.

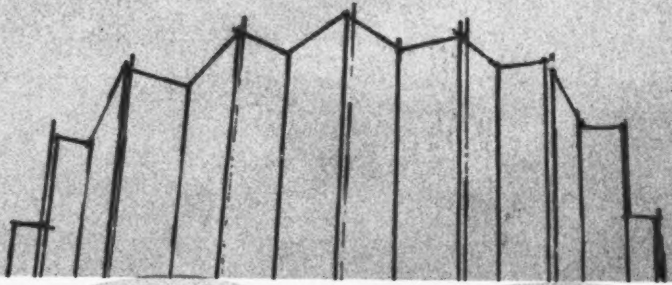
DESCRIPTORS- *HISTORICAL REVIEWS, *TECHNICAL INSTITUTES, *TECHNICAL EDUCATION, *ENGINEERING EDUCATION, PROGRAM DESCRIPTIONS, CURRICULUM, MILWAUKEE SCHOOL OF ENGINEERING, CONCENTRIC CURRICULUM, WISCONSIN,

OSCAR WERWATH ARRIVED IN MILWAUKEE FROM GERMANY IN 1903 AND FOUNDED A SCHOOL TO MAKE SKILLED MECHANICS, TECHNICIANS, AND ENGINEERS OF THE UNSKILLED AND THE APPRENTICED. BY 1908, THE SCHOOL OFFERED TWO FULL-TIME TWO-SEMESTER COURSES IN ELECTRICAL AND MECHANICAL AREAS IN ADDITION TO EVENING PROGRAMS. COOPERATIVE ENGINEERING EDUCATION, INTRODUCED IN 1911, ENABLED STUDENTS TO GAIN PRACTICAL ON-THE-JOB TRAINING. IN THE FIELD OF TECHNICAL EDUCATION, THE SCHOOL PRECEDED OTHER PUBLIC AND PRIVATE EFFORTS IN THE CITY AND IN THE STATE. IN 1917, THE STATE AUTHORIZED THE SCHOOL TO GRANT BACHELOR OF SCIENCE DEGREES IN ELECTRICAL ENGINEERING. THE NEXT YEAR MARKED COMPLETION OF THE DESIGN OF THE CONCENTRIC CURRICULUM, A DESIGN TO WHICH IT HAS REMAINED COMMITTED. THE CONCENTRIC CURRICULUM OFFERS A SUCCESSIVE SERIES OF TERMINAL COURSES EACH COMPLETE IN ITSELF YET PROVIDING, WITH EACH COURSE COMPLETION, AN ADVANCED STEP IN EMPLOYMENT OPPORTUNITY. AT THE SAME TIME EACH COURSE IS A PART OF THE DEGREE PROGRAM. TODAY, THE SCHOOL IS NATIONALLY RECOGNIZED. MORE THAN 300 SUBJECTS ARE OFFERED BY A STAFF OF 125. OVER 58,000 STUDENTS HAVE ATTENDED THE SCHOOL, AND ITS GRADUATES ARE EMPLOYED BY MORE THAN 4,000 FIRMS THROUGHOUT THE WORLD. (EM)

FEB 8 1967

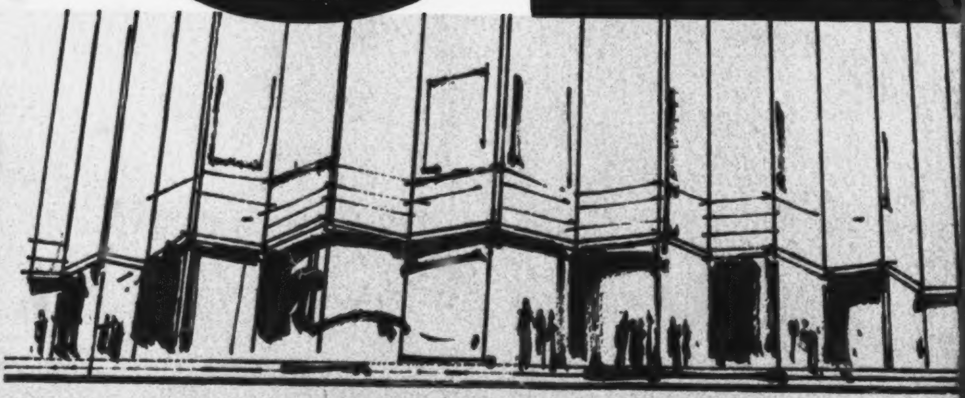
ED019429

SIX DECADES OF SERVICE



03-'63

MSOE



VT02069

2069

MILWAUKEE SCHOOL OF ENGINEERING BULLETIN, Wis.

For six decades, the Milwaukee School of Engineering, an independent, nonprofit institution of higher learning, has faithfully pursued a three-fold objective: to educate and train men, to serve industry, and to advance applied scientific knowledge. To accomplish these services, MSOE educational programs now include two-year engineering technology and four-year engineering curriculums, and specialized technical and supervisory training programs for persons employed in industry.

Throughout its history, this institution has fervently fostered the ideals of our free enterprise system as its graduates have assumed responsible roles in American industry. Today, MSOE is established as a continuing asset both to industry and to thousands of ambitious students. This proud heritage of educational pioneering and aggressive progress presages an even greater future for the School and its students.

Volume 16, Number 1 – January 1, 1964
MILWAUKEE SCHOOL OF ENGINEERING BULLETIN
Published semi-monthly by the Milwaukee School of Engineering, 1025 N. Milwaukee St., Milwaukee, Wisconsin 53201. Second class postage paid at Milwaukee, Wisconsin. Produced by the MSOE Editorial Services Department and the MSOE Production Center.

2961-1263

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

1903

'03-'04-'05-'06-'07
'08-'09-'10-'11-'12
'13-'14-'15-'16-'17
'18-'19-'20-'21-'22
'23-'24-'25-'26-'27
'28-'29-'30-'31-'32
'33-'34-'35-'36-'37
'38-'39'-40-'41-'42
'43-'44-'45-'46-'47
'48-'49-'50-'51-'52
'53-'54-'55-'56-'57
'58-'59-'60-'61-'62

1963

FOUNDER — STUDENT AND EDUCATOR

AN IDEA REACHES MATURITY — THE CONCENTRIC CURRICULUM

EMERGING MSOE

DEVELOPING STATURE

PREPARING FOR EXPANSION

BUILDING FOR THE FUTURE

SIX DECADES OF SERVICE

MILWAUKEE SCHOOL OF ENGINEERING
FOUNDED BY OSCAR WERWATH IN 1903

MSOEMSOE

CONTENTS

CHAPTER PAGE

1 1903 - 1912
FOUNDER – STUDENT AND EDUCATOR 5

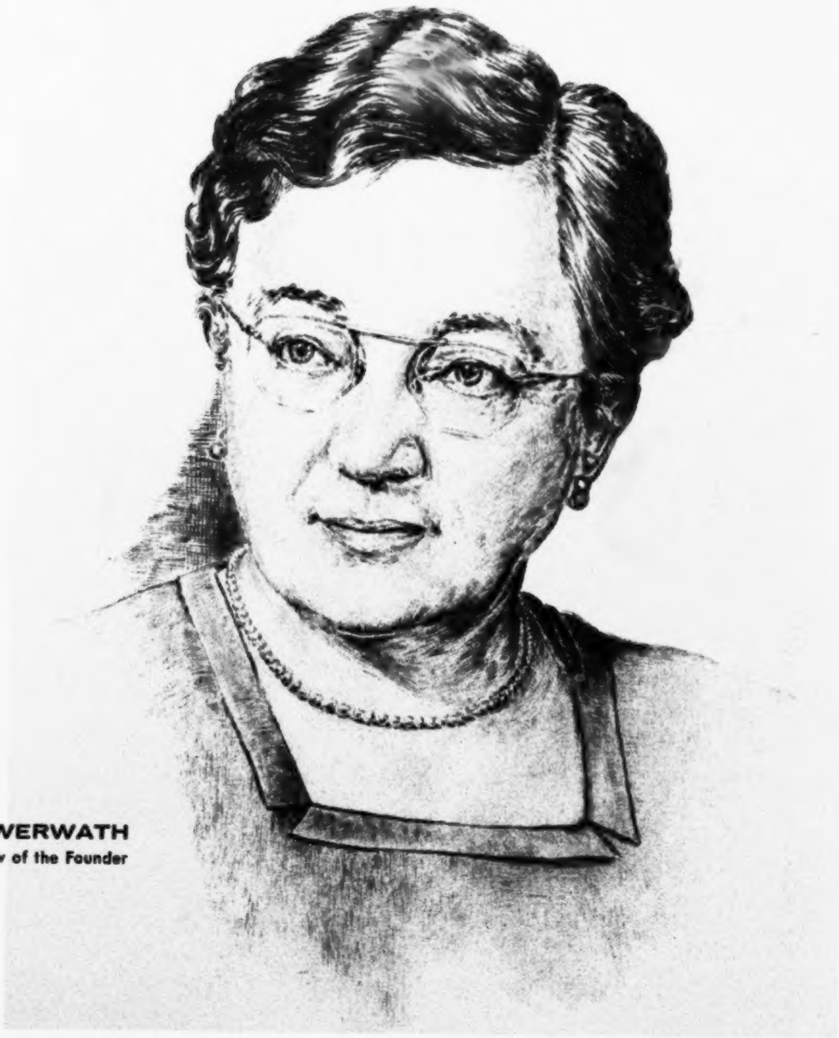
2 1913 - 1922
AN IDEA REACHES MATURITY – THE CONCENTRIC CURRICULUM 13

3 1923 - 1932
EMERGING MSOE 21

4 1933 - 1942
DEVELOPING STATURE 27

5 1943 - 1952
PREPARING FOR EXPANSION 33

6 1953 - 1963
BUILDING FOR THE FUTURE 45

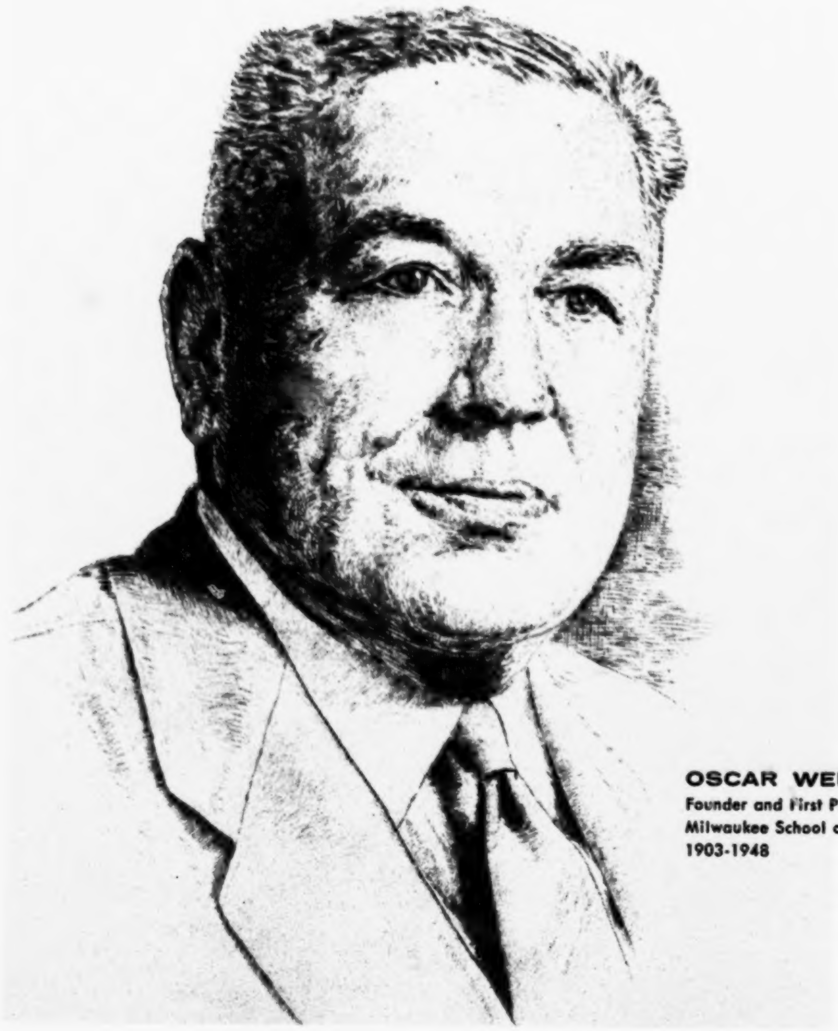


HANNAH SEELHORST WERWATH
Widow of the Founder

Whose life has been a continuous golden thread
woven imperishably throughout the fabric of the Milwaukee
School of Engineering and to whom this history of
SIX DECADES OF SERVICE is dedicated in grateful
recognition of her devoted and inspiring contributions
to the progress of this institution.

1963 — 60th Anniversary Year

Etching by Dr. George Edward New



OSCAR WERWATH
Founder and First President
Milwaukee School of Engineering
1903-1948

Through foresight, tenacity and sacrifice, and with the loyal cooperation of his colleagues whom he inspired, Oscar Werwath pioneered for forty-four years the concentric system of engineering education and the technical institute type of curricula in the United States.

"...He was imbued with an idea which developed into an ambition to render a service to his fellowman."

William George Bruce
MSOE Advisor: 1914-1932; MSOE Regents: 1932-1949

Etching by Dr. George Edward New

1

1903
1912

FOUNDER – STUDENT AND EDUCATOR

An idea, an opportunity, a young man with the talent and courage to put the two in a definite mold for the betterment of his fellowman and his community – these, in summary, were the elements which brought the Milwaukee School of Engineering into being.

The idea enveloped teaching, the special kind of teaching which trains use of hand with thought of mind to create technological and engineering skills. The opportunity came at the dawn of the twentieth century when industry, burgeoning with a host of technological advancements, sought such skills and found them scarce.

The young man was Oscar Werwath, a student of electrical and mechanical technology and science. He came from his native Germany to Milwaukee in 1903, and here founded a school wherein the two branches of learning, theory and practice, were coordinated to make skilled mechanics, technicians and engineers of the unskilled and the apprenticed.

The school grew as Milwaukee grew. It stands today as Oscar Werwath's contribution to the industrial, economic and social progress of his time and ours, his share in the rearing of the community – city, state, nation – we now enjoy. Over 58,000 students have attended its classes; more than 4,000 firms around the world employ its graduates.

For three generations before Carl Werwath, Oscar's father, the family ancestral home was in Stallupoenen, a territorial commercial center and crossroads located near the German-Russian border in East Prussia.

Carl Werwath, born in 1840, gained prominence as an importer and exporter, operating the city's largest department store which had been founded by his father. He married Miss Johannah Hintz whose family was similarly prominent in the history of Stallupoenen.

Active in civic and philanthropic pursuits, promoting the building of schools, the encouragement of the arts and music, Carl Werwath served on the Stallupoenen City Council for over 50 years, during many of them as presiding officer. His long career of civic service won recognition from the German government which awarded him the Crown and Hindenburg medals.

Herr and Frau Carl Werwath had nine children, two of whom died in infancy. The first-born was

Karl who, according to tradition, later inherited the department store. Max, second eldest, became an officer in the Prussian army. Hans came to America, was joined shortly after by his younger brother, Oscar, and for a time was active in the affairs of the school that Oscar founded. He later entered the real estate field and built over 200 homes in Shorewood, a Milwaukee suburb.

1903
1912

Walter Werwath, graduated from a Berlin Business College, in 1909 came to Milwaukee to visit his brothers, Hans and Oscar. Sharing Oscar's enthusiasm for the recently founded technical institute, he joined the staff of the school and was active in its administration until his death in 1952.

Miss Minna Werwath, the elder of the two sisters in the family, married Emil Krug who later became mayor of Stallupoenen. Miss Gertrude married Karl Fromm, pharmicist and physician who practiced in the city of Koenigsburg.

Oscar Werwath's birth date was May 3, 1880. At the age of 9, he sustained a serious spinal injury in a fall while horseback riding. In the long convalescent period that followed, his youthful interests focused on medicine, gradually widened to include science in general, and in particular the new and fast developing fields of electricity and mechanics.

Tutored after primary and secondary schooling, Oscar attended the Mittweida Technical School in Saxony, receiving diplomas in both electrical and mechanical technology in minimum time. For two and a half years he served as supervisor of electrical construction with the Lahmaier Company of Berlin, builders of electric street railway and power plants. He continued his studies in these fields at advanced technical schools in Darmstadt and Hanover and achieved recognized status as a mechanical and electrical engineer.

In 1903, at age 23, Oscar Werwath came to Milwaukee to visit his cousin, Oscar Pieper, who had established a coffee and tea store in the city. His first job was obtained with the Mechanical Appliance Company, predecessor of the present Louis Allis Company, first as a designer and later as consulting engineer. In this capacity, he frequently invited fellow-workers and friends, who had graduated from European technical schools, to his bachelor quarters to discuss the uses and problems of electricity.

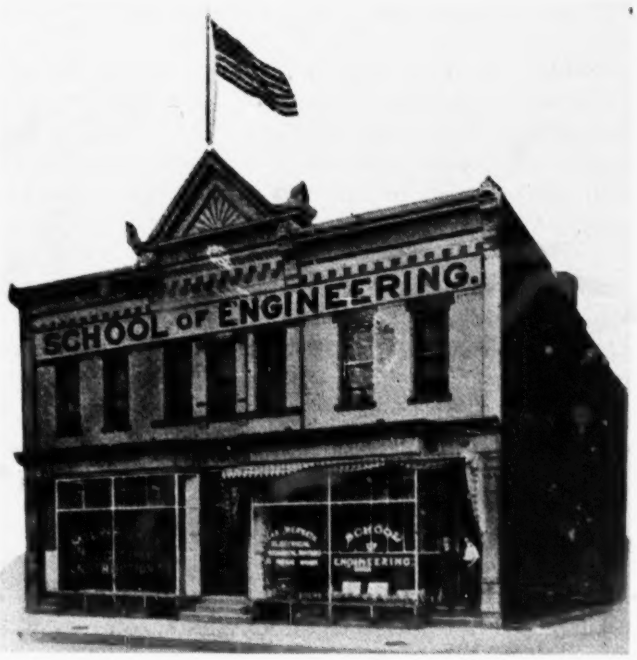
From these informal discussions, Oscar Werwath came to the realization that as this country was beginning to flex its industrial muscles, there were not enough men with adequate technical training and purposeful education in the mechanical and electrical fields to supply industry's needs. He recalled, too, the remark of a former instructor at Mittweida Technikum, when he returned as an alumnus to give a lecture, that he possessed the born characteristics of a teacher.

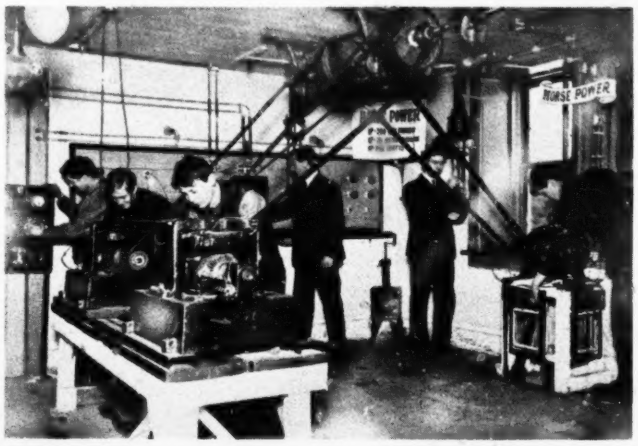
These things in mind, Mr. Werwath persuaded the president of Reute's Business College, on Sixth and Juneau, to let him use some of the school's facilities to teach a course in practical electricity. He recruited seven students and began a series of evening class instructions in German, using his college class notes as texts.

The idea had germinated; opportunity had beckoned. Late in 1905, the young man with talent and courage moved classes to his own quarters and the School of Engineering came into being at 1025–27 Winnebago Street. Assisting in the enterprise were his brother, Hans, and August Ostermann, a friend and fellow instructor.

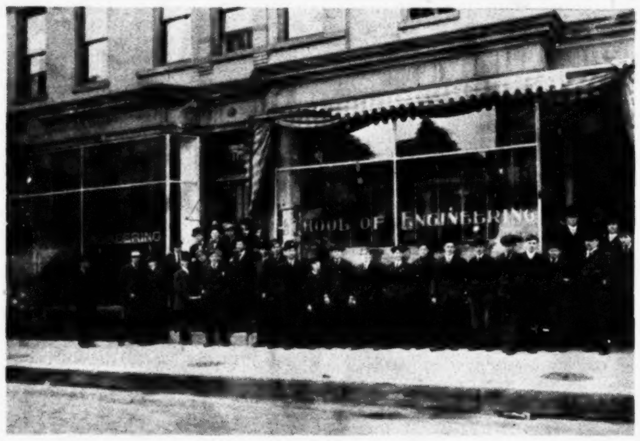
The School was started with a "...definite aim and purpose...," Mr. Werwath wrote many years later. "...The leaders of Milwaukee industries offered cooperation, realizing that future productivity and stability would depend upon educational agencies which could recruit men from the ranks of the untrained, and prepare them properly for positions of technical and administrative responsibilities.

The first permanent home of the School of Engineering was this building at 1025-27 Winnebago Street. The School shared the first floor with two other enterprises in which the founder was engaged, an electrical engineering consulting firm and the Milwaukee Electric Construction Company which produced and marketed small isolated power plants. The six-points area, formed by the intersection of 11th, Winnebago, Vliet and what is now Somers Streets, was an important commercial center of the city at the time. Nearby was the Pabst Brewery, the Ninth Ward Bank, one of the Schusters department stores, the Amsterdam Tea Company, the Atlas Bakery, and the Jaeger Baking Company. Standing in the doorway at right is Oscar Werwath, the School's founder.





In this electrical laboratory of the Winnebago Street building, the students constructed much of the equipment, including the two generators shown at the left. They also were employed part-time, attending school for a portion of the day and working on construction projects during the remaining hours.



Another 1907 picture shows students in front of the Winnebago Street building. At far right are Oscar and Hans Werwath. Enrollment at this location reached almost 250 students and by 1911 the School outgrew these quarters.

1903
1912

"During the first eight years of the School's existence, this program of practical technical training was developed to such an extent that by 1908 students were making their own designs and drawings of equipment which they later built in the School's fully-equipped shops. Experienced teachers, well-trained in theory and practice, were the instructors.

"Electric machines, meters, storage batteries, switchboards, small generators, gasoline engines, and other electric and mechanical appliances were manufactured in the School's shops and marketed. During this period, the first storage battery was installed for automobile lighting in Milwaukee.

"A complete electric lighting plant was designed and built for country homes using the newly patented low-voltage tungsten lamp. This plant was outstanding at that time, and there was a great market for these country-home lighting plants, so that hundreds of such installations were sold to owners of summer homes, farms and small villages. The revenue obtained was used to build up the electrical laboratories and work shops of the School.

"Theory and practice were combined early in the history of the School. The student spent one-half of his time in the laboratories and shop, working with tools, machinery, and apparatus, according to the theories he learned from his books and lectures. The books were specially prepared, edited and compiled by the president, based on his European education and class notes, and practical experience. This form of literature simplified the theory of the subject, and still left it thorough according to the requirements of electrical practice."

This description of the School's pioneering days was written by Mr. Werwath for *The Transmitter*, a quarterly first published by the School in the spring of 1947. In the first decade of the 20th century, the whole concept of technical education was a new one in this country. Schools of the type were in existence in Europe. The technical institute founded by Oscar Werwath in Milwaukee was designed to fill a specific need in America and in the growing Milwaukee industrial complex. It was a pioneering effort. He strove constantly to improve its training techniques, to augment its teaching facilities so that the growth of the School paralleled the expansion of co-related industries.

SCHO OF ENGINEERING

Cobblestone paving carried much of Milwaukee's traffic in 1907. In the driver's seat of this electric auto is Oscar Werwath. The automotive field was one of his early interests, especially further development of electric lighting and later the manufacture of storage batteries for automotive use.

In the fall of 1906, Mr. Werwath visited his family in Germany, proudly displaying a gold watch given him by his first graduating class. He travelled to a number of larger cities, buying electrical equipment for the School. In Hanover, at the home of his cousin, Erich Werwath, he first met the young lady who later was to become his wife, Miss Johannah Seelhorst, the sister of Erich's wife. Miss Seelhorst was about to leave on a two-year teaching mission in Algeria, Africa.

She was born in the city of Rothenfelde in the province of Hanover. Her mother, Mrs. Anna Heinemann Seelhorst, came from a family whose fore-

The founder is pictured in another 1907 vintage automobile with two of his first associates and faculty members, August Ostermann and August Biesgen, seated in back. In a School catalog published during these years, Mr. Werwath wrote that "the system of instruction includes a combination of the best methods used in both German and American electrical schools. By a combination of practical work supplemented by a study of mathematics and the theory of electricity, young men. . .are enabled to accomplish their ambition to become electrical engineers."

bears were founders of a linen industry in Germany. Her father, Frederick Seelhorst, was a metals manufacturer.

Miss Johannah's two sisters were Helena, Erich's wife, and Toni, who later gained fame as a leader in the development of social work in Germany under her married name of Mrs. Toni Jeep Von Schlittgen. Her eldest brother, Fritz, was an electrical engineer in Berlin. Another, William, was a fabrics exporter and importer. The third, Dr. Erwin, became an official of the Siemens electrical manufacturing industries, and the fourth, Dr. Helmuth Seelhorst, a civil engineer.

In 1907, Mr. Werwath's mother passed away and he returned to Germany for the settlement of her estate. Though bereavement at her loss marked his journey, he again met Miss Seelhorst who had completed her assignment in Algeria. He asked for her hand in marriage. The date was set and a year later on April 23, 1908, in New York city, the couple married.

The union was to be blessed with four children. The first son, Karl Oscar, was born March 1, 1909; there were two daughters, Greta and Hannah, and the second son, Heinz, born in 1916.

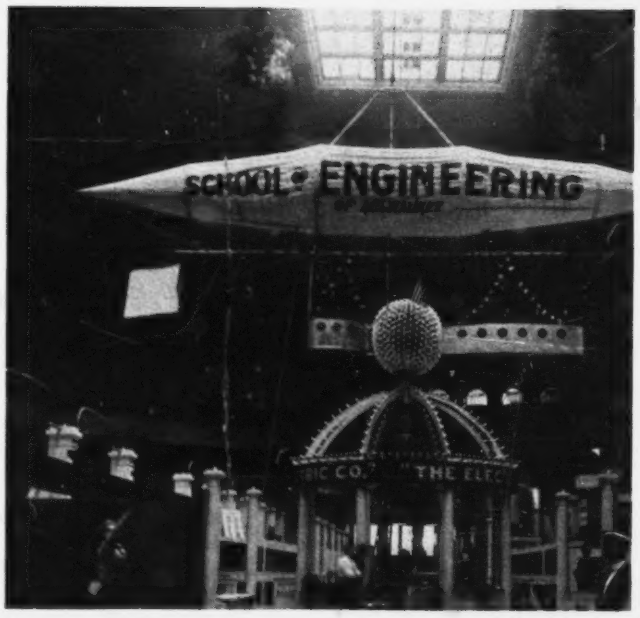
By 1908, the School of Engineering offered two full-time day school 2-semester courses in electrical and mechanical areas in addition to evening programs. In 1910, day and evening programs included a 4-semester electrician course, with an additional two years in electrical engineering, and specialized courses of varying lengths. There were six instructors on the faculty and a student body of 132.

The expansion was financed by Mr. Werwath's inheritance from his mother's estate.

The School Bulletin issued for the 1910-1911 semesters was a well-illustrated 40-page booklet. It outlined the opportunities for young men pursuing its specially tailored areas of career preparation. It quoted the railroad builder, Edward H. Harriman, and the inventor, Thomas A. Edison, on the future of developing the uses of electricity; quoted Theodore Roosevelt on the value of technical education.

There were capsules of pertinent comment under such headings as: "Learn by Doing;" "Trained Man Is Needed, Unskilled Man Pushed Aside;" "If You Have a Trade, You Always Have a Job;" "How We Help You Get a Position;" "What Our Graduates Are Doing;" "Milwaukee is a Beautiful City To Live In."

The Bulletin listed the conditions for admission to the School, rules of discipline, information on examinations and grades, requirements for completion of courses and the awarding of diplomas, the school year calendar, terms and tuition. Tuition fees ranged from a charge of $25 a year for a course



An industrial exposition at the Milwaukee Auditorium in 1911 was held by the Milwaukee Merchants and Manufacturers Association to commemorate the 25th anniversary of its organization. The School of Engineering was invited to participate, and to that end students built the equipment to fly this 25-foot model Zeppelin around the Auditorium by wireless control.

in general chemistry to $120 per year for a course in electrical engineering.

Day school sessions were held from 8:00 a.m. to 1:00 p.m., and night school classes from 7:15 to 9:15 p.m. A minimum grade of 75 was required for passing and report cards were given the students each month to show their standings. Athletics, particularly basketball, were encouraged by SOE.

Pictured in the Bulletin were its facilities, the electro-chemical laboratory, mechanical laboratory, power station and machine shop. "Engineering," it stated, "is a *thing* of *doing*, not a *theory* of *thinking*."

In 1911, the Milwaukee Merchants and Manufacturers Association celebrated its 25th anniversary and invited the School of Engineering to participate in its commemorative industrial exhibition at the municipal auditorium. To that end, the students built the equipment for a demonstration of a 25-foot model Zeppelin in flight by wireless control.

The sending station was set up at one end of the auditorium and the receiving apparatus installed in the gondola of the Zeppelin. Student operators were able to send the model Zeppelin on controlled flights around the auditorium, ringing bells, activating propellers, turning landing lights on and off — all by means of wireless-directed devices. Only four years prior, Marconi had sent his first wireless message from Nova Scotia to Ireland.

For the 1911-1912 semesters, 210 students ranging in age from 15 to 40 enrolled in the School whose facilities were moved in 1912 to the Stroh Industrial Building on the corner of Michigan and Jackson Streets.

"All conveniences of a modern, fire-proof constructed building are provided," wrote the School's principal, Oscar Werwath, in the foreword of the 1912 Bulletin. "Nothing has been spared to fit anew our classrooms and laboratories adapting them perfectly to the requirements for teaching all branches of electrotechnics, drawing and chemistry as applied to electricity."

Occupying one floor of the building, the School offered a one-year course covering the requirements to become a practical electrician, and the electrical engineering course which included the one-year electrician course and required three years for completion. There were a variety of evening classes.

The School was growing apace with the times. Mr. Werwath possessed the scholar's keen interest in scientific developments. He likewise maintained close personal contact with the students, seeking to know them as individuals, and showing a sympathetic understanding of their problems. He employed many of them in the manufacturing division of the School until growing enrollments made the practice no longer feasible.

Increased enrollments and greater concentration on the educational aspects of the institution led to his pioneering in "cooperative engineering education." This program with local industry, introduced in 1911, provided agreements to employ students on a part-time basis, thus enabling them to gain practical on-the-job training as well as the opportunity to finance part of the cost of their education. Tours of local industrial plants were conducted regularly.

Among the concerns participating in the program were the Allis-Chalmers Manufacturing Company, the Allen-Bradley Company, the Louis Allis Company, Globe-Union Incorporated, the Harnischfeger Corporation, the Johnson Service Company, the Electric Railway and Light Company, and the Wisconsin Telephone Company.

The fame of the School was also growing. Among its graduates in 1912 were men from Racine, Ashland, and Athens, Wisconsin, as well as Milwaukee, Ohio and Mexico.

The student roster carried names from Minnesota, Iowa, Illinois, Indiana, and Ohio; from South Dakota, Missouri, Wyoming, and California; from Michigan, Pennsylvania, New Jersey, and New York; from Delaware and the province of Ontario, Canada.

Other signs of stature and stability marked these founding years of the School.

Its library offered students a selection of scientific books and periodicals giving access to research and developments in their chosen and allied fields of study.

Representatives from the east and midwest industrial research centers of the country were invited to the School as guest lecturers.

Students were trained in the art of public speaking, giving lectures before their own classes, and before parents and visitors at the exhibition of student work in mechanical drawing, electrical sketching and constructive electricity held annually in June.

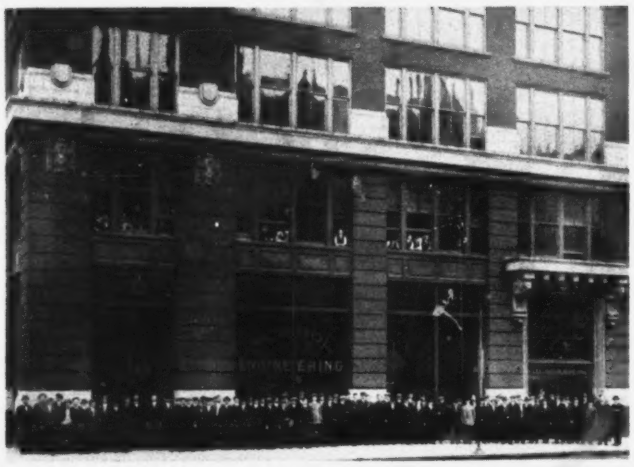
The first of a number of student publications was begun in November 1912 under the direction of Mr. Werwath, a monthly magazine titled *Electroforce*. Its purpose, to quote one of the student editors, was to "bind more closely students and graduates of the School of Engineering of Milwaukee, and also conduct an interchange of ideas amongst them which will, we expect, spread beyond the school jurisdiction and have the same effect amongst the entire electrical fraternity."

Mention here must be made of the work of Hans Werwath who was associated with the School in these pioneering days first as an instructor, then as educational director. His greatest single contribution was probably the devising and perfecting of the Unit Board method of mounting laboratory equipment. The Unit Board held all the equipment necessary for a single experiment, enabling the student to see clearly what he was doing and the results obtained.

Hans Werwath also systematized the courses offered in the early days of the School to give the student the greatest amount of theory and practice within the shortest possible time.

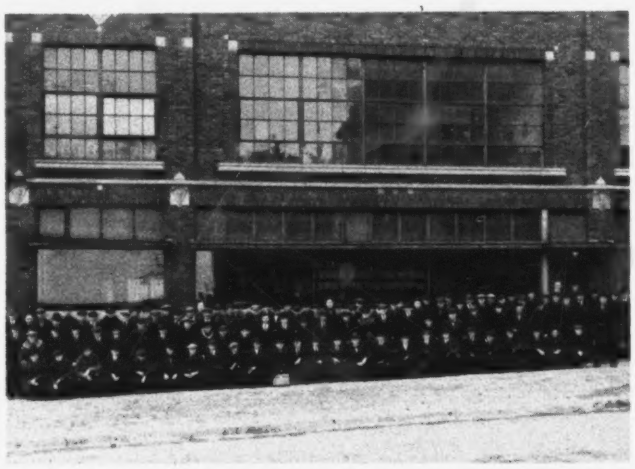
Walter Werwath joined the School administration as secretary in 1909, later served as treasurer and business manager. Under his direction, the School put out its first catalog and curriculum announcements, stimulating an interest and recognition that soon became nationwide. Shortly after the first World War, this publicity brought to the School roster students from practically every corner of America and 20 foreign countries.

The first decade in the School's existence was paced by the enthusiasm of youth and the combined knowledge of the administration and faculty in the young field in which they were working. The strong foundations for the future were laid despite many obstacles. In the field of technical education, the School of Engineering preceded other public and private efforts in the city of Milwaukee and in the state. In the process the School also provided manpower for the pioneering Milwaukee enterprises which later grew into industrial giants.



Students pictured in front of the Stroh building with some of their instructors and Mr. Werwath (third from the end on the right). "Here," he wrote in the 1912 catalog, "our rooms are perfectly lighted and command a view of the lake which is unsurpassed and assures most healthful conditions for our students under which to execute their work. All conveniences of a modern, fire-proof constructed building are provided, and nothing has been spared to fit anew our classrooms and laboratories adapting them perfectly to the requirements for teaching all branches of electrotechnics, drawing, and chemistry as applied to electricity."

College of Engineering quarters were opened formally on March 17, 1917, in the Insurance building on Broadway when the Charter granted by the State of Wisconsin empowered the School to grant Bachelor of Science degrees. In his address to the students and faculty on this occasion, William George Bruce, secretary of the Milwaukee Association of Commerce, complimented the School and its management, and called attention to the value of the institution to the citizens of Milwaukee and the State. Business offices of the School were on the first floor of the building, classrooms and laboratories on the 3rd, 4th, and entire 5th floors. Shown here is one of the Student Army Training Corps units formed at the School during World War I.



After the war, this four-story building on Marshall Street housed the School of Practical Electricity and the School of Automotive Electricity. It was in this building that the School of Engineering put Milwaukee's first radio station, WIAO, on the air for its initial broadcast on September 22, 1922.

2

1913
1922

AN IDEA REACHES MATURITY – THE CONCENTRIC CURRICULUM

In the years 1903 to 1912, the shortened route to a useful trade-profession, designed and developed by the School of Engineering founder, had been sufficiently travelled to be regarded as a major educational highway. Industry, which had depended on the apprentice system, gave this new approach enthusiastic support. Young men who looked to industry for jobs and their livelihood, and with the good sense to steer clear of dead-end streets in earning it, welcomed the chance to obtain training in the formation of skills industry wanted.

The School gave them this opportunity, and the excellence of its method was soon to win formal recognition by the State of Wisconsin.

In the years 1913 to 1922, industry's personnel needs multiplied, as new inventions multiplied, as new fields for craftsmen, technicians and engineers skilled in these refinements also multiplied. The period saw changing and improving techniques in methods of production – the production of electromotive equipment for land, sea and air transportation, for communications, for appliances in home and factory, for the automotive industry, for public service utilities, for machinery and parts manufacture.

Careers in these and allied fields beckoned to many young men, beckoned both to those who had and to those who had not, the time, the means, the aptitude to pursue four years of college study before reaching their specific goal.

To both groups, the School offered educational opportunity. In its second decade of existence, it enriched the courses offered in technical training areas, expanded and upgraded courses in the college level of electrical engineering instruction. It added scientists of national renown to its faculty. It formed an Industrial Advisory Board to review and guide curriculum development.

These moves brought recognition for excellence in 1917 when the State of Wisconsin authorized the School to grant Bachelor of Science degrees in Electrical Engineering. A year later they marked completion of its design in developing the concentric curriculum, a design to which it has remained committed ever since.

In brief, the concentric curriculum is a system of education tailored to equip the student in college level engineering standards needed for the degree award combined with parallel technical training. It is designed to consider the aptitude of the individual, to offer courses in a time sequence suited to his capacity to absorb them. The concentric curriculum offers a successive series of terminal courses each complete in itself yet providing, with each designated term of successful academic achievement, an advanced step in employment opportunity. At the same time, each of these courses forms a necessary part of the full thirty-six month course leading to the Bachelor of Science degree.

The progression of curriculum development which, combined with research and introspective study, led to the adoption of the concentric plan, may be noted from year to year in the second decade of the School's existence.

In 1913, courses included a one-year junior electrician program, a one-year senior electrician program, a two-year program in electric light, power and telephone engineering, all of which preceded five additional semesters of electrical engineering.

In 1914, the curriculum was consolidated to a year of practical electricity followed by two years of electrical engineering.

In 1915, this became one year of practical electricity, one year of practical electrical engineering, with a one-year college course in engineering.

In 1917, the courses, offered in three-month terms the year around, included one year of practical electricity, two years of commercial engineering, and three years of electrical engineering. Each course succeeded the previous one in sequence.

This presentation of courses in three-month terms the year around was a pioneering form of the quarter system which later came to be considered an essential educational technique.

In addition, special 12 to 15-month day and evening vocational training was offered in the electrical trades and in electrical and mechanical drafting. Cooperative technical education, described as "earn-while-you-learn" was also offered, permitting the student to attend classes for 25 hours a week and work another 20 or 22 hours.

In 1920, the School consisted of four institutes: College of Electrical Engineering (12 terms); Institute of Electrotechnics (8 terms); School of Practical Electricity (2 terms); and School of Automotive Electricity (1 term).

The first Bachelor of Science degrees in Electrical Engineering were conferred by the School in 1919. In 1920, it offered the honorary degree of Electrical Engineer to College of Engineering graduates for distinguished achievement in the successful practice of their profession.

The terms *electrotechnics* and *electrotechnician* were coined by Mr. Werwath to describe the training and the trained man who would fill a gap in the profession.

The electrotechnician, he wrote, "represents that special type of electrical expert who combines in a large part the technical knowledge of the engineer with the operative skill of the electrician. He is particularly qualified to fill the commercial gap that has sprung up between these two branches of the electrical profession and to lend intelligent cooperation with the engineer while at the same time exercising skilled supervision over the electrician.

"Fundamentally, the function of the electrotechnician is to interpret the intricate technical plans, designs and ideas of the electrical engineer and to carry out, or supervise the carrying out, of their mechanical or commercial application."

Additions to the School faculty in these years of curriculum development brought to its teaching roster names of national repute. Among them was William Baum, for some years an associate of Dr. Charles P. Steinmetz at the General Electric Company in Schenectady, New York. A graduate and former instructor at the University of Karlsruhe, Baum joined the staff of the School of Engineering in 1916 as dean of the Engineering Department.

A year later, another associate of Dr. Steinmetz, Dr. John D. Ball, joined the staff as professor of electrical engineering, and Francis A. Vaughn, a fellow of the American Institute of Electrical Engineers, was named the School's vice-president.

In 1913, ten years after its beginnings, the School formed an Industrial Advisory Board to review and guide curriculum development. Its first members, with the School principal, Oscar Werwath, were George J. Balzer, principal of Washington High School, and Thomas Berry and Leslie Killam, plant engineers for the Wisconsin Telephone Company. In the ensuing years more educators and industrialists were added to the Board and by 1918, when it was called the Advisory Council, membership totalled 44 men. Among them was Dr. Charles P. Steinmetz, consulting engineer for the General Electric Company and acknowledged in his time as a genius in electrical research and achievement.

Dr. Steinmetz came to the United States in 1889, penniless and unable to speak English. Within five years he was appointed chief consulting engineer for the General Electric Company in Schenectady. Among other credits, he discovered the laws of hysteresis which enables losses of electrical power due to magnetism to be accurately forecasted before starting construction of motors, generators and transformers. He also established the theory of electrical transients, which led to the development of lightning arrestors to protect high power transmission.

In 1913, the School expanded its facilities to occupy two floors in the Stroh Industrial Building. In addition to administrative offices, student library and lecture rooms, a new electro-chemical laboratory was set up adjoining the motor-dynamo and alternating current laboratories, the drafting room and the mathematics department.

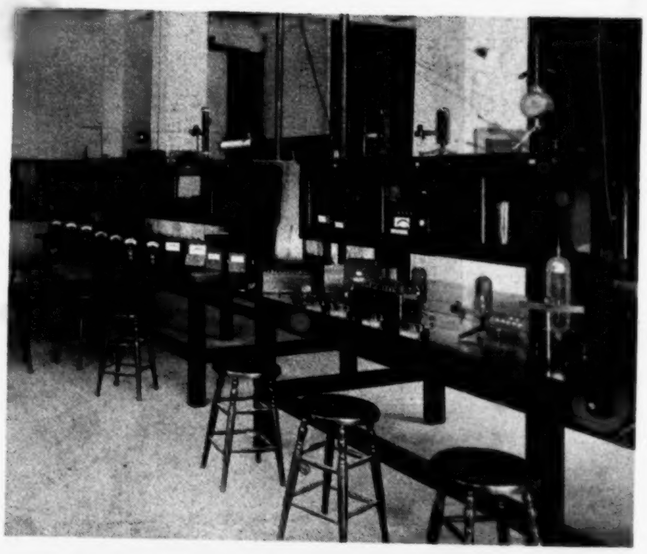
One of the nation's foremost electrical engineers was another immigrant, Charles P. Steinmetz, who was employed by the General Electric Company as a consultant. Steinmetz applied mathematics to the development of alternating (AC) current machinery and circuits. He became acquainted with the work of the School of Engineering and agreed to serve on its Advisory Board in 1916. Two of his associates at General Electric in Schenectady, William C. Baum and John D. Ball, joined the faculty and became deans of the School, to expand on the idea of the concentric curriculum in electrical engineering education, and to further the concepts of this application of electrical theory to practical equipment.

The Wisconsin Telephone Company equipped a new telephone exchange laboratory, a miniature duplicate of its own plant. Additional equipment came from electrical device manufacturers, companies located in Milwaukee, Chicago, Trenton, Buffalo, Boston, Pittsburgh, Philadelphia, Syracuse, Ottawa, and London, England.

A special organization for students, *The Electrons,* was organized in 1913; the *Phi Delta Omega Society,* founded in 1914, the year a student orchestra was also formed as part of student activities.

An Extension Division, called The School of Practical Electricity, for home study programs was

In 1906, Mr. Werwath returned to Europe, visiting the industrial fairs. On the death of his mother, he returned to the continent a second time in 1907. He accomplished several important missions on these trips. First, he found his bride who later followed him to America in 1908. Secondly, from resources made available through a legacy from his mother, he purchased excellent electrical measurement equipment which helped build an exacting laboratory procedure amplifying the extremely strong theoretical discipline in the curriculum. In late 1911, the School moved into the Stroh building at Michigan and Jackson Streets which is now occupied by the American Appraisal Company. At right is a laboratory in this building. At this time, the State of Wisconsin began its training programs at the trade level, and Mr. Werwath put his full attention to developing curriculum at the technical institute and baccalaureate levels.



established in 1915. The course consisted of a series of ten texts, prepared by Oscar Werwath on the theory of electricity and practical laboratory problems. Instructors were named to guide those taking these home study programs in eleven Wisconsin cities, others in Illinois, Michigan and Missouri. Libraries and schools in these areas stocked the set for public use.

Student enrollment for the academic term beginning in 1916 was 374; two years later it reached the 950 figure. The College of Engineering was moved to the Insurance Building at Broadway and Michigan Streets, the technician student facilities and laboratories remaining at the Stroh Building.

The new College of Engineering quarters were formally opened on March 17, 1917, when the charter given by the State of Wisconsin empowering the School to grant Bachelor of Science degrees in Electrical Engineering was presented.

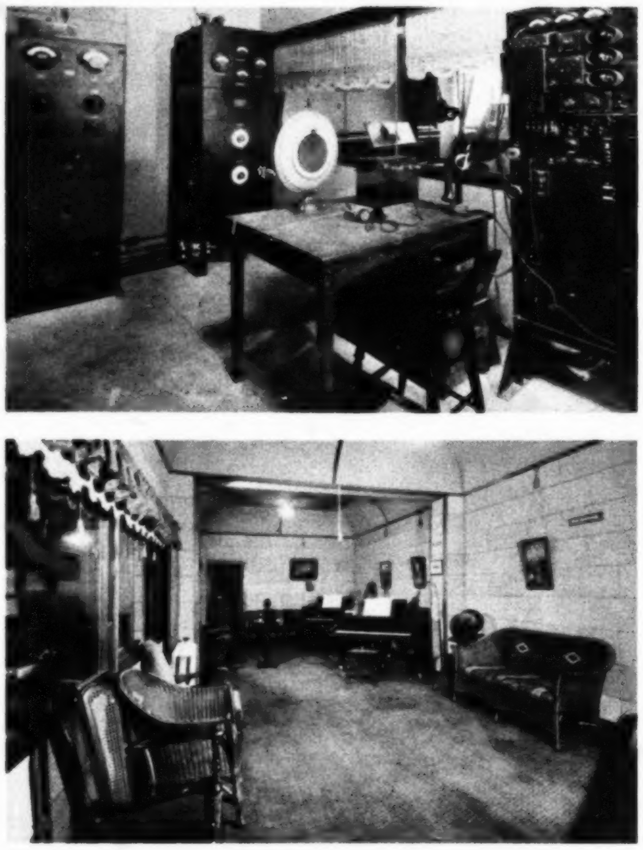
A short three weeks later, on April 6, the United States entered the war. During the conflict, one unit of the Student Army Training Corps (SATC) and four units of the Reserve Officers Training Corps (ROTC) were organized at the School, in accord with the Defense Act of Congress of June 3, 1916, and subsequent directives of the War Department to institutions of learning.

Impact of the conflict was felt throughout all facets of American life. In the School's particular field, a letter of President Wilson, dated January 18, 1918, was pertinent:

"My attention has lately been called in particular to the falling off in the number of engineering students and this has given me a good deal of concern, because it is not only immediately necessary that as many students as possible should prepare themselves for engineering duties in the Army and Navy, but it is also of first consequence to the country that there should be an adequate supply of engineers for the period of reconstruction which must follow the war.

"Not only has technical training become of enormous importence in military operations, but the role of the engineer has become more and more important in every process of our industrial life, and I hope that influences may go out which will call the attention of parents throughout the country to the importance of making any sacrifice that it is possible to make to keep their sons in the schools even during these trying times."

In 1919, the American Institute of Electrical Engineers authorized the establishment of a student



The School's radio station, WIAO, transmitted on a wave length of 360 meters with 100 watts power. The transmitter room in the Marshall Street building is pictured at left above. Later, the School purchased the equipment of a powerful station at Zion City, Illinois, putting a 165-foot antenna into service on top of its new building at Oneida and Jackson Streets, and changing the call letters to WSOE. The studio from which many programs were broadcast is shown below.

branch at the School of Engineering, and all instructors teaching electrical subjects became affiliated with the Institute.

Movement of the School's facilities continued. The College of Electrical Engineering and the Institute of Electrotechnics were housed on the 3rd, 4th, and 5th floors of the Insurance Building at 373 Broadway, while the School of Practical Electricity and the newly organized School of Automotive Electricity were located in a four-story building at 415 Marshall Street.

At the time there were about seven and one half million automobiles in operation in the United States. The School of Automotive Electricity offered would-be mechanics a concentrated three-month course in automotive electrotechnics, or a six-month program of night classes.

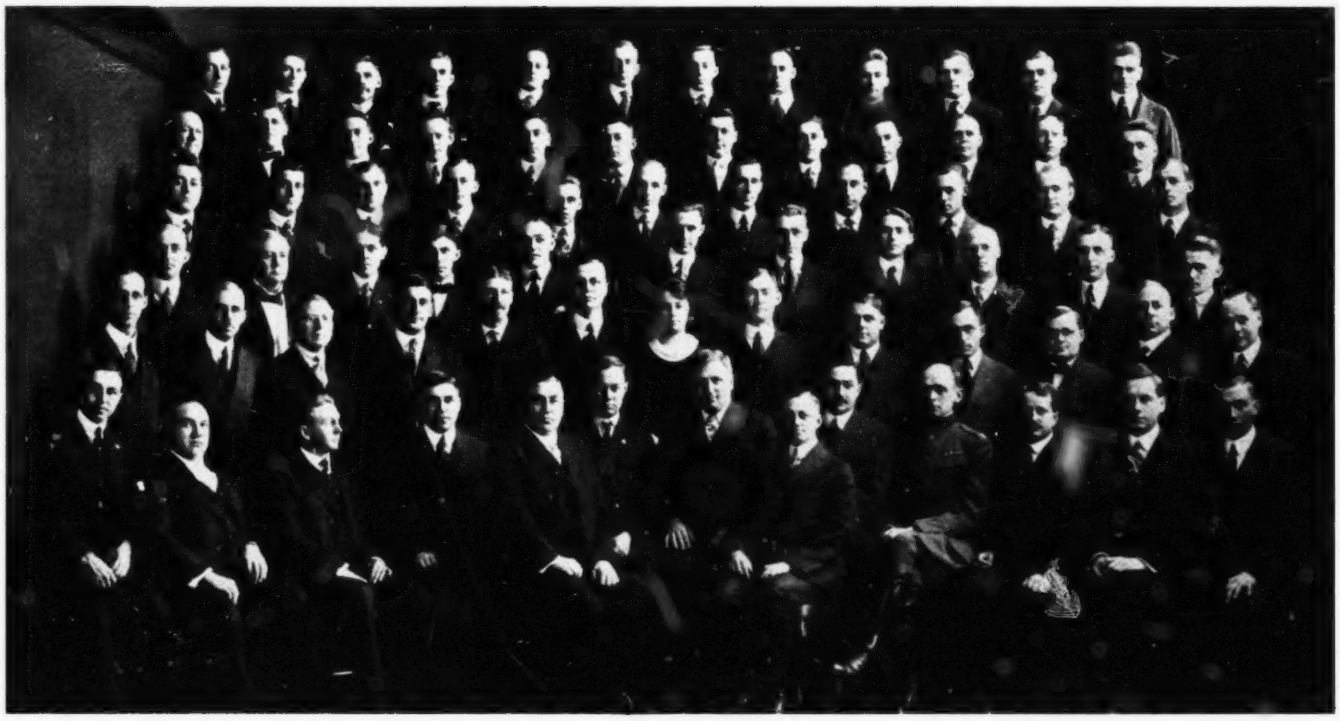
The School's interest in wireless and radio dates from its inception. In its early years students were building crystal sets to pick up messages from around the country. The strength of these sets was augmented when a large Marconi station was set up near the School's Winnebago Street location. The antenna was erected between two tall chimneys of the Pabst brewery.

The students made tuning coils, relays, and controls in the School's shops; in 1911, demonstrated the wireless-controlled flight of a model Zeppelin at the Milwaukee Auditorium. In 1914, the School was operating a complete sending and receiving station at its quarters in the Stroh Building, a transmitter using the call letters 9YAD.

In September, 1922, the School began broadcasting over a 100-kilowatt transmitter, station WIAO, one of three then in operation in Wisconsin and one which led to the setting up of the School's courses in radio technology and commercial radio engineering.

It was in this period that two of the men mentioned above joined the staff and for many years thereafter associated their talents and achievements with the School's growth and tradition.

Francis Arthur Vaughn joined the faculty in 1917, serving as the School's vice-president from 1918 to 1932. A graduate of the University of Wisconsin in electrical engineering, his special field was lighting. He designed the Milwaukee street



lighting system, and was a consultant on similar installations in other cities. He was a member of the American Society of Mechanical Engineers, the National Association of Broadcasters, the National Electrical Light Association, and was a fellow of the American Institute of Electrical Engineers.

John D. Ball joined the faculty in 1917 as professor of electrical engineering. He was a graduate of the University of Illinois in mechanical and electrical engineering, later won a doctorate in philosophy at Marquette University, specializing in physics and education.

Dr. Ball spent ten years at the General Electric Company plant in Schenectady, in the testing department, standardizing laboratory, and as a consulting engineer with Dr. Steinmetz. At the School of Engineering he served as professor, dean of the college, director and chief consulting engineer.

He authored a number of textbooks, wrote feature articles for newspapers and periodicals, articles dealing with such diversified topics as school curricula, bonus systems and hospital administration. During the first war, he was secretary of the public affairs committee of the Milwaukee Council of Defense. He was a fellow of the American Institute of Electrical Engineers and a member of the International Professional Men's Society. Lastly, on many School of Engineering radio programs, he was the "voice of WSOE" before and for some time after the station was taken over by the Wisconsin News and its call letters changed to WISN.

This decade ended with a greatly expanded School, with the pattern under the concentric curriculum firmly cast, but with the same economic problems which faced the nation as a whole as an aftermath of World War I.

The faculty and staff of the School in 1920 numbered over seventy as enrollments in its four divisions increased with the influx of students discharged from military duty. Pictured are (left to right):

Front row – Earl L. Consoliver (BE, ME), Director of the School of Automotive Electricity; Hans D. Werwath, Director of the School of Practical Electricity; Benjamin F. Crenshaw (BA, MA), Professor of English and History; Walter Werwath, Treasurer; Oscar Werwath (EE, ME), President; John D. Ball (BS EE), Vice-president and Dean of the College of Engineering; Willard C. Hartman (BA, MA), Registar; Francis A. Vaughn (BS), Vice-president and Professor of Illuminating Engineering; Arthur E. Kienth (BS), Professor of Chemistry; Ben F. Ristine (BA, MA), Captain, U. S. Infantry and Professor of Military Science and Tactics; Carroll G. Brown (BS), Professor of Electrical Engineering and Secretary of the Faculty; Frederick C. Raeth (BS, MTD), Professor of Physics and Electro-Chemistry; Ben A. Bovee (BS EE), Professor of Experimental Electrical Engineering, in Charge of Organization and Discipline.

Second row – George E. Teter (BA, MA), Director of the Institute of Electrotechnics; Harry W. Lyon (PhB), Instructor of Physics; William T. Collins, Office Staff; Ralph O. Chamberlain, Director of the School of Drafting; Arthur A. Koch (MS, PhD), Professor of Chemistry; Henry Ericson (BA, BS), Professor of Mathematics; Esther H. Shapiro (BA), Instructor of Mathematics; Walter W. Stewart (BA), Instructor of Mathematics; Jesse J. Knox (BS), Instructor of Mathematics; Franz A. Kartak, (BS EE), Professor of Electrical Laboratory and Chairman of the Faculty; R. O. Marsh, Instructor of Drafting; A. A. Wedemeyer (BS ME), Head of the Department of Drafting; Clarence H. Ferguson (BS, PhB), Instructor of Mathematics.

Third row – Chester H. Yeaton (MA, PhD), Head of the Department of Mathematics; Asher C. Ball (BS, LLB), Professor of Engineering and Commercial Law; Howard D. Matthews (BS EE), Professor of Electrical Machine Design; Charles F. Parske, Secretary of the School of Practical Electricity and Instructor, Electrical Laboratory; Peter C. Winther (BS EE), Instructor, Electrical Laboratory; H. D. Chopple, Instructor, School of Practical Electricity; Kenneth W. Johnson (BS EE), Instructor, Electrical Laboratory; N. W. Coil (BA), Head of the Department of General Science; Fred G. Fox (BA, MA), Professor of English; (Unidentified); Charles S. Hetzell, Instructor of Drafting.

Fourth row – Emil Dostal, Instructor of English; Hugh Morren, Instructor, School of Practical Electricity; William K. Stumpf, Instructor of Chemistry; Edward H. Wesle (BS), Instructor, Chemical Laboratory; Irving Hartson, Office Staff; Eugene E. Stevens, Office Staff, Faculty Manager of Athletics; J. E. Thompson (BA), Head of the Department of Physics and Chemistry; Erwin A. DeLaruelle, Secretary of the School of Practical Electricity; John L. Gordon (BS EE), Instructor, School of Automotive Electricity; J. M. Peterson (BS EE), Instructor, School of Automotive Electricity; Charles D. Prinz, Laboratory Superintendent, School of Automotive Electricity.

Fifth row – Stapleton C. Dietrick, Jr. (BS), Instructor of Drafting; Donald C. Atherton (EE, BS ME), Professor of Mechanical Engineering; J. C. Castelman (BA), Head of the Department of English; Francis E. Kelley (BS), Head of the Department of Heat, Light, and Power; R. A. Rickman (BA), Instructor of English; Herman W. Bocher (BS EE), Instructor, Electrical Laboratory; Walter H. Bieck (BS EE), Head, Electrical Laboratory; H. Orville King, Instructor, School of Practical Electricity; Joseph E. Hughes, Instructor of Electricity; Christopher Bach, Instructor, Wiring and Telephone Laboratory; Walter E. Hennig (BS EE), Supervisor, Armature Winding and Motor Generator Laboratory; Walter Bertler, Cashier.

Sixth row – E. F. Helz, Laboratory Instructor, School of Automotive Electricity; C. E. Pettingill (BS EE), Instructor, School of Automotive Electricity; August Biesgen, Instructor of Mechanical Drafting; Matthias J. Maiers (BS EE), Instructor, Electrical Laboratory; John J. O'Connor, Instructor of English; C. J. Koch, Instruction Supervisor, Extension Division; Frank P. Kasparek (BS EE), Instructor, Electrical Laboratory; Fred W. Krotzer (BS), Instructor, Electrical Laboratory; Lt. Roy O. Schrodt, Instructor, SATC; Frank J. McCormick, Director of Physical Training and Athletics; Chester C. Aiken (BS EE), Instructor, Electrical Laboratory; George H. Walters, Instructor, Electrical Laboratory.

RADIO STATION WSOE

On this night of dedication we come into Thy sacred presence, thanking Thee again for the gift of radio to the world, for the men of genius and intellectual vision who consecrated their time and talent to bringing to fruition this discovery which has proven such a helpful boon to humanity.

May we hallow Thy name, as we trace back the gift to the beneficent Giver. Every good and perfect gift comes from Thee, with whom there is no variableness nor shadow that is cast by turning.

Almighty King of Kings, may this instrument of the air be the mighty means of publishing the glad tidings of salvation to the dark corners of the earth, so that all may know the gospel of love and life, and know the friendship of the Prince of Peace.

1923
1932

May Thy will be done, by us on this militant earth, as it is done in Thy triumphant heaven. Grant that the messages that shall be broadcast from this state may contribute to the wholesome enjoyment of the people, edifying their minds and warming their hearts. Grant that the lonely might find cheer and the seeker after truth the bread that feeds the hungry soul.

O Thou who knowest the needs of every listener, whether the occupant of an invalid's chair or comfortably settled by a fireside, Give us this day our daily bread, the bread of happiness and content, the bread of inspiration and truth. And forgive us our trespasses, as we forgive those who trespass on us, knowing our weaknesses and our desire for a quiet mind and a restful spirit.

Lead us not into temptation, that we descend unto unholy levels debasing the art of speech, song or sweet music to be broadcast into millions of ears and hearts. But deliver us from all forms of evil to this end, then, bless this institution which dedicates this day this powerful instrument for the entertainment, edification and inspiration of an unnumbered invisible host of friends everywhere in this country, our sister countries and the isles of the sea.

Thou art able to do above all that we can ask or think, for Thine is the kingdom and the power and the glory forever and ever.

AMEN

BROADWAY BUILDING

O Thou Great Giver of every good and perfect gift, Who hast put the divine spark of intellect into the mind of man, furnishing him with great potential powers of invention and discovery, we gather in Thy name this afternoon in the formal dedication of this new school home for the advancing interests of the student in the fascinating science that deals with light, heat, power, sound, and motion. We thank Thee for these fundamental forces and the great part they play in our everyday lives. They are servants that speak of Thee and the greatness of the universe Thou didst ordain for the service of humanity. May they speak to our hearts in terms of harmony, making us realize always that the fundamental forces of Nature and human nature serve best the individual and society when humanity utilizes them in harmony with the Divine Will. God grant us wisdom and eyes unsealed that with clear vision we may see our science dedicating its discoveries, not to private enrichment or the destruction of the world's accummulated gains through devasting war, but to life's ennoblement and the high ministry of public service.

May we link the high supremacies of the soul to the advances in learning, arts and skills. Thus shall we have a vision splendid and the skills learned in the school room shall be dedicated to the service of our fellowmen and in such service demonstrate our gratitude to the Giver of every Good Gift.

In the Name of the Master of Men.

AMEN

These dedication prayers were given by Rev. John F. Fedders, D.D., Pastor, Lake Park Lutheran Church, on the occasion of the dedication of Radio Station WSOE in 1925 and the Broadway Building in 1933.

3

1923
1932

EMERGING MSOE

The third decade in the School of Engineering history coincided with a period in United States history which saw an effort to shake off the economic aftermath of the war, an effort to advance to new and occasionally fancied heights of progress, and the onset of the depression in 1929.

The School felt the strains and stresses of the times. Industries which employed some of its students and gave promise of employment to its graduates, were forced to retrench, even as new fields of industrial service were being explored.

Annual enrollments reached the 1,200 mark in this decade which saw the organization of the School recast. In 1932, the State of Wisconsin granted a new charter, incorporating the School as a nonstock, nonprofit institution governed by a a Board of Regents.

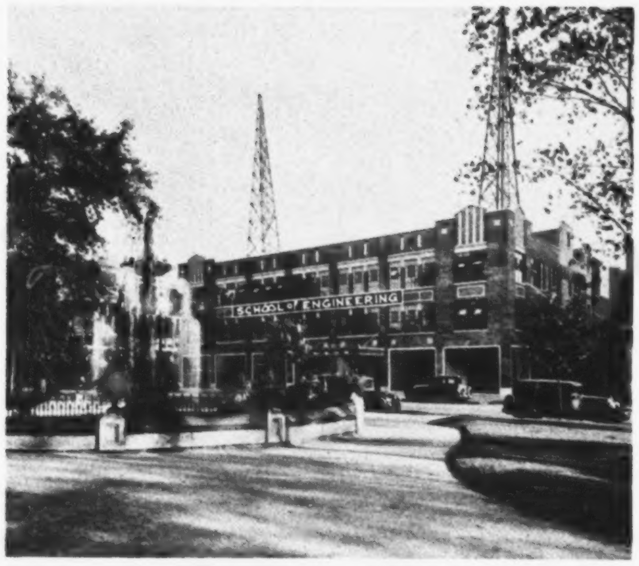
Its original building on Winnebago Street bore the name School of Engineering. About 1910, when registration began to include students from Wisconsin and other states and foreign lands as well, the distinguishing words "of Milwaukee" were added, and in 1932 with the granting of the new charter, the name became The Milwaukee School of Engineering.

In 1923, the School moved all of its facilities into the four-story building at 415 Marshall Street. Basic courses were offered in practical electricity, electrotechnics, commercial electrical engineering, and electrical engineering leading to the Bachelor of Science degree. The School of Automotive Electricity offered day and evening programs of instruction.

The next year, in 1924, the enrollment register listed 773 students from 42 states and 13 foreign countries. A 6-month course in radio servicing was introduced, and a branch of the School, The Canadian School of Electricity, was established in Montreal.

By 1926, enrollment totalled 1,088 students from 45 states and 18 foreign countries. Again facilities were moved, from Marshall Street to a three-story building at Jackson and Oneida Streets across from the then Court House Square.

1923
1932



The School of Engineering moved its facilities into this building at Oneida and Jackson Streets in October, 1926. Located across from old Court House Square, this 1926-1932 home of the School is just a block away from the the newest structure of its present academic plant, the Allen-Bradley Hall of Science.

The School's radio station which began broadcasting in September, 1922, over a 100-kilowatt transmitter and using the call letters WIAO, was given new and more powerful equipment in 1925. A 165-foot antenna array was installed on top of the School Building at Oneida and Jackson Streets and on July 7, the call letters were changed to WSOE. In its new home Radio Station WSOE gave Milwaukee a representative station, and broadcast programs of historic interest to the City.

Col. Charles Lindbergh spoke to a Milwaukee audience over Station WSOE, emphasizing the uses of radio and the need for radio beacons in aviation. The dedication of the Lake Front airport, honoring Lieut. Lester Maitland was broadcast by WSOE, as were addresses by President Herbert Hoover and Vice President Charles Dawes.

WSOE featured varied programs, music suited to a wide range of tastes, lectures by members of the School faculty, and broadcasts of religious services from Milwaukee churches on Sundays.

In 1928, WSOE was acquired by the *Wisconsin News*, Hearst Corporation newspaper in Milwaukee, and the call letters were changed to WISN.

In 1924, the School set up an amateur radio station licensed with the call letters W9SO and operated by students who were members of the Radio Club. The station was part of the College Radio Union, and was selected as the key station of the western sector of the country for College Radio Union communications.

The station was also affiliated with the American Radio Relay League, a national organization of amateur stations. With its own clubroom on the roof of the School building, the Radio Club served as a center for the interests of all students taking radio service courses.

Station W9SO was the first in the country to pick up distress calls from San Juan in 1926 when the hurricane disaster in Puerto Rico wiped out communications with the mainland. It also communicated with Byrd's expedition to the South Pole.

The twenty-third anniversary of the School's founding was observed with the dedication of its new home on Oneida and Jackson Streets in December, 1926.

Electrical refrigeration was rapidly becoming one of the country's major industrial developments. In 1919, there were an estimated 3,000 household and commercial units in use, in 1925 over 100,000, and by 1930 over 1,000,000.

In 1927, the School introduced a three-month course in electrical refrigeration. Other programs included the one-year certificate course in commercial electrical engineering with specialties either in radio, automotive electricity, airplane ignition systems and airport illumination, or electrical refrigeration.

Mr. Werwath developed this new 12-month technician program in commercial electrical engineering, a program which was the forerunner of this type of education subsequently adopted by many technical schools throughout the country.

Under the concentric pattern, the commercial electrical engineering program formed the first third of the electrical engineering course which, with eight additional quarters of study, led to the Bachelor of Science degree. A junior electrical engineering program for non-high school graduates also was offered, and 3 and 6-month courses in practical electricity, plus home-study programs through the extension division.

During the 1927-1928 academic year, the student body totalled 1,237 from 44 states and eight foreign countries. Commercial electrical engineering was programmed with electives in radio, refrigeration, or automotive electricity. A 3-month radio course and a 6-month master electrician course also were offered.

The curriculum for the 1931-1932 academic year listed the 1-year commercial electrical engineering course, the 2-year industrial electrical engineering course, and the 3-year electrical engineering course leading to the Bachelor of Science degree. Each course preceded the previous one in sequence.

Also offered was a 1-year program in commercial radio engineering, with training in broadcasting, talking pictures, and television, a 3 to 8-month day and evening program in electrical refrigeration, and a 6-month electrician course. The extension division continued its programs.

On November 23, 1928, the 25th anniversary of the founding of the School was observed. Under the direction of its founder and president, Oscar Werwath, the institution had trained over 20,000 students in a variety of specialized technical skills and more advanced trade-professions. Mr. Werwath had developed new ideas in technical education which were of such stature that they were accepted by the youth of the nation and by industry as well, making possible courses which were actually pioneering achievements in American education.

A three-month course in electrical refrigeration was introduced by SOE in 1927. In a few years, the curriculum offered a complete technician course in refrigeration, heating and air conditioning engineering, the forerunner of current programs in mechanical engineering and allied engineering technologies. Pictured here is a corner of the 1927 RHAC laboratory.

For this outstanding accomplishment, he was presented with a testimonial of esteem by the community's industrial leaders at the 1928 annual homecoming banquet "in appreciation of the splendid and lasting contribution made by him as man, citizen, and educator to the material progress of his time and generation."

Among those honoring Mr. Werwath on the occasion were Otto H. Falk, president of the Allis-Chalmers Manufacturing Co.; Henry Harnischfeger, chairman of the Harnischfeger Corporation; S. B. Way, president of the Milwaukee Electric Railway & Light Co.; William Monroe White, manager of the hydraulic department at Allis-Chalmers; and H. P. Andrae, president of Westinghouse Electric Supply Co., successor of the Julius Andrae & Sons Co. from among whose employees Mr. Werwath had recruited the first seven students for his informal after-dinner lectures on electrical theory and practice back in 1903. Joining in the tribute were many others, leaders of industry and community development, some of whom were soon to become more closely associated with the School as members of its corporate family. A statement in the anniversary brochure read:

"As a great industrial center, Milwaukee has long realized that its productive stability is largely dependent upon the educational agencies which must constantly recruit men from the ranks of the untrained and fit them for positions of responsibility in the city's industries. In this field, the School of Engineering has achieved a distinctive place.

"During the past quarter of a century, it has made an outstanding contribution to the progress of industry – not only in Milwaukee, but wherever its graduates have made places for themselves throughout the United States and many foreign countries.

"It is in recognition for this service that the industrial leaders of the community have given their whole-hearted support to the School in the great and good work which it is doing."

Support was again instanced in 1930 when local industrialists announced a proposal to create a $100,000 loan fund for students at the School. The fund was inspired by the success of a smaller loan foundation begun two years previously to which Milwaukee manufacturers and friends contributed, aiding the work which had been carried on for years by the School itself.

Enrollments at the institution were growing. Financial problems, characteristic of the era, were also increasing. The whole enterprise had grown beyond financing by a single individual. The time had come for an organizational format concomitant with the maturing status of the institution. This new organization provided for direct participation by the industries which employed School of Engineering graduates, and it came into being in 1932.

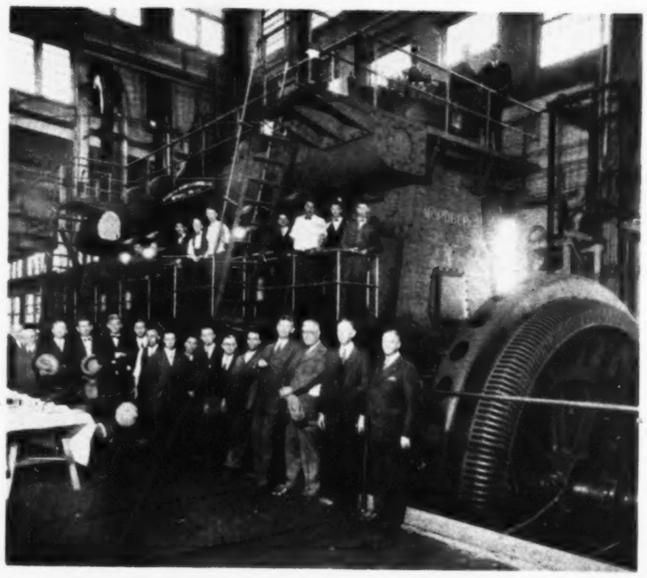
It was then that the make-up of the School was reorganized from a privately owned to a quasi-public supported type of institution when the State of Wisconsin granted a new charter, incorporating the School as a nonstock, nonprofit institution governed by a Board of Regents.

Members of the Industrial Advisory Board, organized back in 1913, provided the nucleus for the formation of the Corporation of the Milwaukee School of Engineering. Signing the Articles of Organization on June 28, 1932 were: T. Chalkley Hatton, Alvin P. Kletzsch, Thomas L. Rose, Gustave J. A. Trostel, William F. Eichfeld, Charles Friend, John Herzfeld, and Arthur Simon.

Joining the incorporators as members of the first Board of Regents were these other Advisory Board participants: William George Bruce, Fred H. Dorner, Walter F. Dunlap, Paul W. Hammersmith, Walter Harnischfeger, Joseph Heil, I. L. Illing, Bruno Nordberg, and J. D. Wanvig, Jr. Subsequently elected Regents were Harry L. Horning, Alfred Morawetz, and John S. Owen, II.

The Articles of Incorporation were filed in the Register of Deeds office on July 11, and signed July 13 by Theodore Dammann, Wisconsin Secretary of State. They contain this statement of purpose reaffirming the basic principles of founder Werwath:

"...establishing and conducting a school offering training and education in engineering subjects and such other subjects of a coordinate or cultural nature desirable in a curriculum organized to prepare its students to enter the field of engineering, and generally to maintain and conduct an institution of learning in electrical, allied and kindred sciences..."



At the request of Government engineers, School of Engineering students assisted in making acceptance tests of this huge power generating unit built in Milwaukee for service at the Panama Canal. The unit consisted of a 4,000-horsepower Nordberg diesel engine, direct-connected to a 2,300-volt Allis-Chalmers alternator rated at 3,125 kw. The over-all length of the engine and generator was 61 feet, its height 21 feet, its total weight 1,000,000 pounds. E. C. Bayerlein, Nordberg vice-president, wrote to President Werwath: "The work these boys did was certainly a credit to your institution."

Chairman of the charter group was Mr. Eichfeld, president of William F. Eichfeld & Sons, and past president of the Milwaukee Association of Commerce; the Vice-chairman was Mr. Trostel, president of Albert Trostel & Sons Co. The Secretary was Mr. Rose of the architectural firm of Kirchoff & Rose, designer of the Empire Building, the Palace Theater, and other Milwaukee structures; the Treasurer, Mr. Friend, attorney-at-law and president of the Bonded Attorneys' Association.

Mr. Bruce was president of the Milwaukee Harbor Commission and of the Bruce Publishing Co.; Mr. Dorner, national vice-president of the American Society of Mechanical Engineers; Mr. Dunlap, president of Klau-Van Pietersom-Dunlap Associates; Mr. Hammersmith, vice-president and general manager of Hammersmith-Kortmeyer Co.; Mr. Harnischfeger, president of the Harnischfeger Corporation.

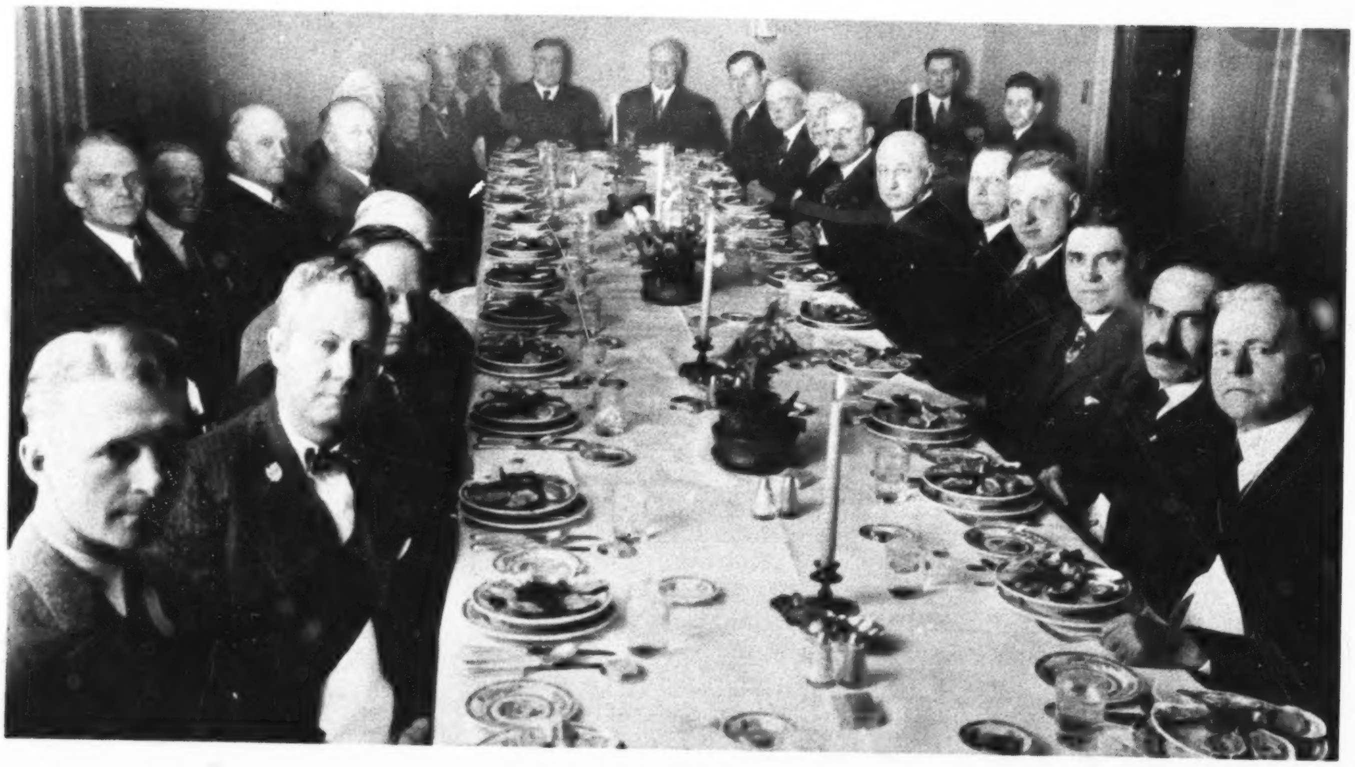
Mr. Hatton was consulting engineer for the Milwaukee Sewage Commission; Mr. Heil, vice-president of the Heil Co.; Mr. Herzfeld, treasurer of the Boston Store; Mr. Horning, president of the Waukesha Motor Co.; Mr. Illing, illuminating engineer for the Milwaukee Electric Railway & Light Co.; and Mr. Kletzsch, president of the Milwaukee Auditorium Board.

Mr. Hatton was named chairman of the executive committee whose members assisted in the departments of education, industrial relations, student welfare, equipment, public information, building and housing, finance and judiciary.

Mr. Werwath was elected president of the new School, and was encouraged to carry out on an expanded basis the concepts so laboriously laid out in its first three decades under his guidance.

One of the first acts of the new Corporation was to buy from Frank Klode, the former German-English Academy building at 1020 North Broadway. This was the first of the ten buildings now used by the School in the area of its present site. The careers of the faculty and staff were continued at the School under the new Corporation.

The School was now ready to take its place as an established institution of higher learning and technology, an institution of national rank, serving industrial Milwaukee which was emerging as a world leader in many fields. The productivity of its graduates and substantial support by the citizenry of Milwaukee promised further development and growth.

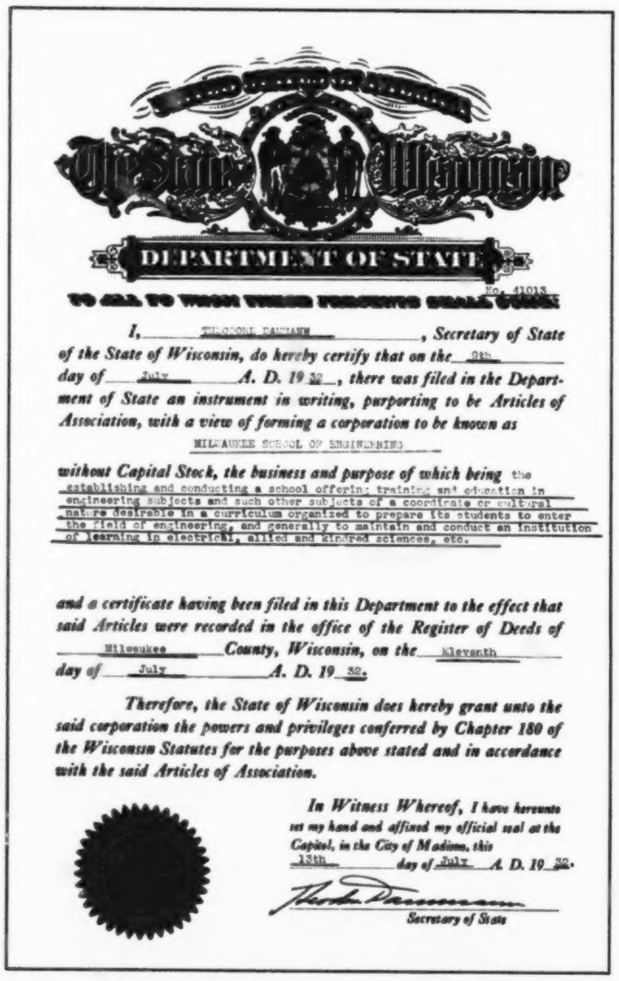


By the end of the third decade of the School's existence, the effects of the great depression were felt very heavily by the institution. Although there was an excellent enrollment, students and their parents frequently could not meet tuition bills. Alumni who had been advanced money were not able to repay their obligations. In 1930, a group of industrial advisors gathered to discuss the establishment of a student loan fund. From these discussions came the formation two years later of the present nonstock, nonprofit corporation under a charter from the State of Wisconsin. The School was renamed the Milwaukee School of Engineering. Many members of the original advisory group then became members of the Corporation. Among those pictured above at the 1930 dinner meeting is the first Chairman of the MSOE Board, Mr. William F. Eichfeld, seated second from the left. With the founder, Mr. Oscar Werwath, at the far end of the table are (left) Mr. William George Bruce, one of the first members of the Advisory Board, and (right) Mr. Alvin P. Kletzsch, who later became the head of the Student Aid Association.

4

DEVELOPING STATURE

1933
1942



The State of Wisconsin

DEPARTMENT OF STATE

No. 41013

I, THEODORE DAMMANN *, Secretary of State of the State of Wisconsin, do hereby certify that on the* 9th *day of* July *A. D. 19* 32 *, there was filed in the Department of State an instrument in writing, purporting to be Articles of Association, with a view of forming a corporation to be known as*

MILWAUKEE SCHOOL OF ENGINEERING

without Capital Stock, the business and purpose of which being the establishing and conducting a school offering training and education in engineering subjects and such other subjects of a coordinate or cultural nature desirable in a curriculum organized to prepare its students to enter the field of engineering, and generally to maintain and conduct an institution of learning in electrical, allied and kindred sciences, etc.

and a certificate having been filed in this Department to the effect that said Articles were recorded in the office of the Register of Deeds of Milwaukee *County, Wisconsin, on the* Eleventh *day of* July *A. D. 19* 32.

Therefore, the State of Wisconsin does hereby grant unto the said corporation the powers and privileges conferred by Chapter 180 of the Wisconsin Statutes for the purposes above stated and in accordance with the said Articles of Association.

In Witness Whereof, I have hereunto set my hand and affixed my official seal at the Capitol, in the City of Madison, this 13th *day of* July *A. D. 19* 32.

Secretary of State

Three fundamental objectives – to educate and train men, to serve industry, to advance applied scientific research – were envisioned by the founder and kept fresh throughout his leadership in the history of the Milwaukee School of Engineering. They were closely interwoven in the year to year progress of the institution and at times given individual impetus.

The Industrial Research Institute of the Milwaukee School of Engineering was inaugurated in 1935 to assist manufacturers in discovering new and improved methods of production. Although many large corporations had set up research laboratories, others found that it was not economical to maintain their own research divisions. The large amount of apparatus, space and time needed for prolonged experimental study also made it impractical in many factories.

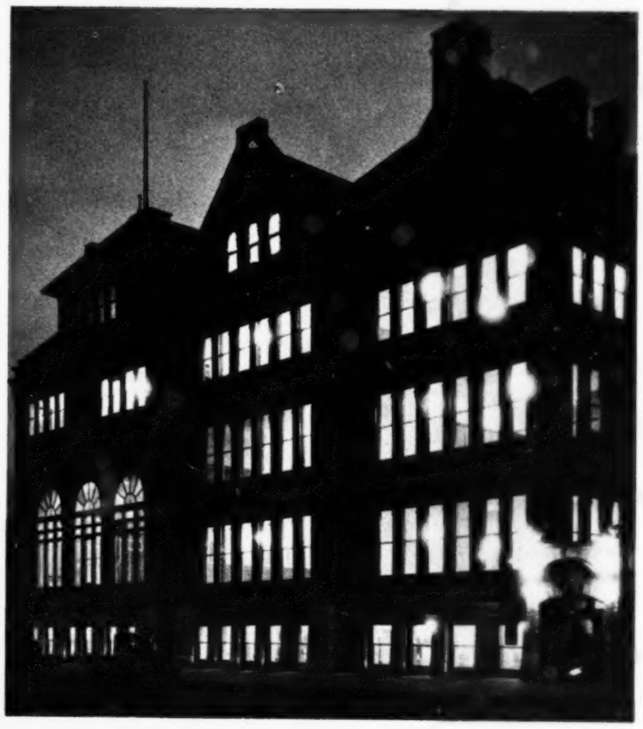
Recognizing these factors, the administration of the Milwaukee School of Engineering offered the use of the School's laboratories and research staff to industry through its Industrial Research Institute. The Institute was organized with four objectives in mind: to serve as a training school for industrial scientists and engineers, as an industrial experimental station, as center for investigations in applied engineering, and as a clearing house on specific scientific information for the public.

For a number of years, the work of the Industrial Research Institute was directed by Klaus L. Hansen, chairman of the Industrial Advisory Committee, and Carl J. Fechheimer, chairman of the Committee on Professional Degrees.

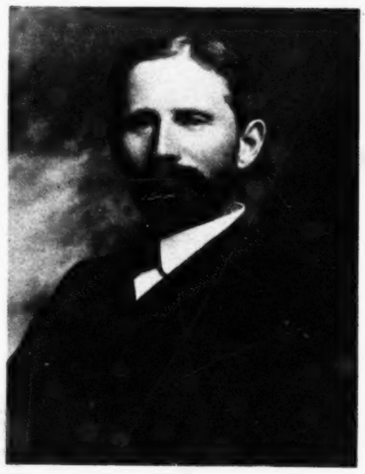
Governed by the Board of Regents, the Institute was under the direction of the officers of the

1933
1942

With the formation of the Corporation in 1932 under State of Wisconsin Charter, the Regents immediately purchased the former German-English Academy building on North Broadway. Built in 1853 with a gymnasium and more classrooms added in 1892, the structure was occupied by the Academy which became the Milwaukee University School in 1918. Some years later, MUS moved to its present location on Hartford Avenue. The Broadway building then was used by Frank Klode as an exclusive furniture store and had been completely remodeled. After some additional remodeling for the School's purposes, this building became a source of inspiration for developing the stature of the institution.



Vice-chairman of the Board of Regents from 1932-1936 and long-time President of the Student Aid Association, Mr. Gustave J. A. Trostel.



MSOE alumni have been active participants in School affairs, particularly in the counselor and endowment programs. One of these groups is pictured here. Standing (from left) are Edward J. Rogers '20; Erwin E. Brinkman '19; Arthur L. Krumhaus '06; seated (from left) are Charles M. Birkett '26; Grover E. Kruecke '20, the first student to enroll at the School in its original location on Winnebago Street; Joseph A. Havlick '21; August J. Raasch '09; and Frank Hodik '27.

School. The Dean of Engineering supervised the faculty members conducting experiments and tests. Sponsored research projects were conducted individually in accordance with the terms of the research contract. Occasionally such studies formed the basis for the Bachelor's thesis of a senior student or of a post-graduate training program.

A few years after the Institute was organized, Industrial Research fellowships were made available to students who had completed the first three years of study required for baccalaureate degree status and who had served as technicians in projects of the Institute.

Earlier, in 1934, a series of scholarships was made available to freshmen entering the School – honor scholarships, industrial scholarships, and a number of competitive scholarships set up by the honor roll alumni.

The Engineers' Alumni Association, organized in 1921 by graduates of the College of Engineering and now functioning as a national group with local units in New York, Chicago and Milwaukee, brought the attention of members to specific projects for improvement of the School's facilities. The MSOE Alumni Association, organized in 1948 for all former students of the School, became a catalyst for further developments.

Another vehicle for these common interests, organized in 1936, was the Associated Alumni Endowment Foundation, which assisted in enriching the library and laboratory facilities. Among items obtained through alumni efforts in this period were a McBeth illuminameter and a Lummer Brodhun photometer for use in the physics laboratory, a tychometer for the electrical machine laboratory, a Western Electric Wheatstone bridge for the wiring and mechanics laboratory; also an oscillograph equipped with ground screen for viewing steady states and a film carriage for photographing transients.

In this period the School lost a number of its staff members and close friends among its industrial associates.

In 1934, Francis Arthur Vaughn, its vice-president from 1918 to 1932, died; also T. Chalkley Hatton, chairman of the executive committee of its Board of Regents since 1932; and Alvin P. Kletzsch, for over 20 years a member of the Advisory Council, in 1930 the originator of the Students' Foundation Fund, and since 1932 a member of the Board of Regents.

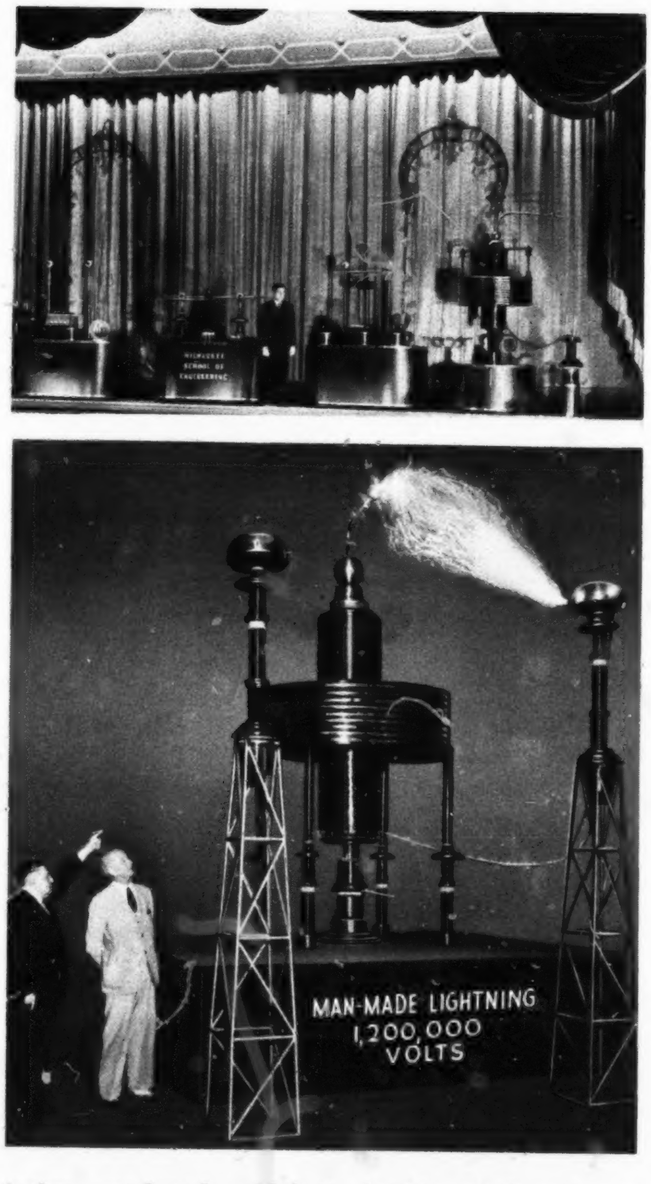
Thomas L. Rose, Secretary of the Board of Regents since 1932, died in 1935, and in 1936 Harry L. Horning and Gustave J. A. Trostel.

Mr. Horning, diesel engine designer and President of the Waukesha Motor Company, was a member of the Industrial Advisory Council since 1930 and of the Board of Regents since 1932. Mr. Trostel, President of the Albert Trostel & Sons Company, was President of the Student Aid Association and Vice-chairman of the Board of Regents. In an address to the alumni in 1943, President Werwath said of him:

"Through the passing of Mr. Gustave J. A. Trostel, the School lost one of its best friends. Mr. Trostel served for many years as President of the Student Aid Association, which made it possible for many of you to complete your college education, especially during the recent financial stress. Mr. Trostel was also Vice-chairman of the Board of Regents, and his counsel and financial assistance in times of stress, had much to do with bringing the School to the point where it is today."

Mr. Werwath at the time also paid tribute to Mr. Charles Friend, deceased in 1943, "who served as Regent and Treasurer of the School for the past twelve years and was a constant advisor and genuine friend."

In this period, too, the School gained invaluable publicity through the medium of a lecture demon-



Throughout the 1930's, a lecture-demonstration on "The Wonders of Modern Electricity" was given by the MSOE Lecture Department before high school groups in Wisconsin, Illinois, and Michigan; before meetings of professional societies; at the Century of Progress Exposition in Chicago; at the Milwaukee-Wisconsin Exposition at the Milwaukee Auditorium; and at the Midsummer Festival at the lake front. Pictured in the lower photograph is the Tesla coil which was used to produce a 12-foot spark of lightning during the demonstration. Shown with President Werwath is Rudolph Hokanson, president of the Lake Front Festival. The lecture-demonstations originated in the Winnebago Street era when exhibitions were held at the end of each school year to show all the electrical equipment and machinery built by the students in the School's shops.

stration on "The Wonders of Modern Electricity." The story, as Mr. Werwath told it to the alumni in 1943, follows:

"In 1934, I visited the World's Fair in Chicago and had the opportunity of meeting the general manager of the Transporation Building, Mr. Watros. I told him about our wonderful lecture on 'The Wonders of Modern Electricity' and the demonstration of the one and a half million volt Tesla coil, which was used to make lightning of a 12-foot spark. He was very much interested, and I was able to convince him that the lecture demonstration 'The Wonders of Modern Electricity' would be a great attraction for the World's Fair. A contract was made to furnish the School a complete lecture hall, seating 550 and with standing space for 250, free of charge, if we would put on the lecture demonstration eight times a day.

"In order to cover the overhead expense, arrangements were made with Harnischfeger Corporation, Globe-Union Mfg. Co., Square D Co., Industrial Controller Co., and the Milwaukee Street Lighting Department to rent from us some of our exhibition space. The revenue obtained this way enabled the School to carry out the agreement and put on over 800 demonstrations during the exhibition year of 1934, attended by over half a million World's Fair visitors. The operation of the 1,500,000 volt Tesla coil, which was built entirely in our School laboratories, produced a 12-foot electric spark and was one of the startling shows in the Transportation Building. A certificate of recognition of our splendid exhibition was received from Century of Progress Exposition authorities.

"The Midsummer Festival arranged by the City of Milwaukee was an outstanding annual event at-

At the onset of World War II, the training of weldors became one of the major functions of the School in addition to the collegiate program. Pictured are a group of students in their training booths and a class of victory-signalling war-time weldors.

tended by over a million visitors. Mr. Rudolph Hokanson, President of the Festival, requested me to participate in the Lake Front Exhibits in 1937. I accepted, and with the cooperation of Milwaukee's leading industries such as Allen-Bradley, Allis-Chalmers, Air Reduction, Carrier Air Conditioning, Cutler-Hammer, Globe-Union, Harnischfeger Corporation, The Heil Company, Louis Allis Company, Mueller Furnace, RCA Taylor Electric, Square D, T.M.E.R. & L. Co., Waukesha Motor, and Westinghouse Electric Supply Co., the first industrial exhibition sponsored by the Milwaukee School of Engineering was a marvellous success.

"The Industrial Exhibition was placed in a 220-foot tent, and over 50,000 people visited and marvelled at the exhibitions of Milwaukee industries. The lecture 'The Wonders of Modern Electricity' with high-voltage demonstrations, was given hourly. These exhibitions were repeated periodically until the beginning of the war.

"The Lecture Department of the School, through its remarkable success obtained at the World's Fair, was asked to be the major attraction at three state exhibits during the year 1935, namely: State Convention of the National Association of Power Engineers, at Appleton; First Annual Milwaukee-Wisconsin Exposition, Milwaukee Auditorium; and the National Association of Power Engineers, Milwaukee.

"Lectures on 'The Wonders of Modern Electricity' were given in over 100 high schools in the State and in many high schools in Illinois and Michigan. As a result, over one million people saw and admired the demonstration."

The first course in welding technology at the Milwaukee School of Engineering was offered in 1933, and within two years a 1-year program in commercial arc welding engineering, on day and evening schedules, was attracting students in increasing numbers. These courses were inspired by the personal interest of Mr. Walter Harnischfeger, and the School's Welding Institute was equipped by the Harnischfeger Corporation.

Chief engineers and welding superintendents of many Milwaukee firms made up the Advisory Board with Klaus L. Hansen, consulting engineer for Harnischfeger Corporation, as chairman.

After studying at the University of Illinois, Mr. Hansen was employed as consulting and designing engineer by Westinghouse Electric, The Louis Allis Co. and others. He holds patents on various arc-welding processes, joint patents on induction motors, and has published a number of technical papers, chiefly concerned with welding. He has held various offices in the American Institute of

Electrical Engineers, in the American Welding Society, and is past president of the American Association of Welding Engineers. He was awarded MSOE's first degree of Honorary Electrical Engineer in 1938, was elected to the MSOE Corporation and Board of Regents in 1950. On his retirement as Regent and General Chairman of the Industrial Advisory Committee in 1956, the School awarded him a special citation "for a quarter century of distinguished service." He has been honorary General Chairman of the Industrial Advisory Committee and an honorary regent since that time.

The Welding Institute, which trained over 5,500 men in its first seven years of operation, reached a peak in 1940. There were five shifts of classes each day plus evening groups. When World War II began and industry needed replacement personnel, MSOE set up short intensified courses in welding to help meet the demand. This program included special courses for women, and in January, 1944, a sixteen-session welding supervisor program was launched to give men more advanced training in the field of welding fabrication.

Throughout this period the School continued the development of its concentric curriculum with integrated technical institute and collegiate level programs in electrical engineering and allied fields.

In 1936, study programs consisted of four basic 1-year courses: commercial electrical engineering, commercial radio engineering, commercial arc welding engineering, and refrigeration, air conditioning engineering. An additional 1-year program in industrial electrical engineering added to any of the basic programs led to a 2-year certificate, while two additional years in electrical engineering plus the industrial electrical engineering course, preceded by one of the four basic courses led to the Bachelor of Science degree.

Short vocational programs added in 1937 included the 3 or 5½-month courses in electric arc welding, electrical refrigeration and air conditioning, welding technology, master electrician and radio servicing.

In 1940, MSOE offered a three-month concentrated course in aircraft welding and a 2-year aerotechnician program in conjunction with the Curtiss-Wright Milwaukee Airways for land plane instruction and the Milwaukee Seadrome for seaplane instruction. A glider was built as part of the laboratory work of the students. It was subsequently purchased by the Army Air Force and used for training purposes. The aerotechnician program offered courses in wood fabrication, aerodynamics, navigation, meteorology, as well as aircraft assembly, rigging and instrumentation. The courses in ground school and flight training continued through 1944.

In the period between 1919 and 1942, the School awarded Bachelor of Science degrees to 563 graduates.

The December 7, 1941 attack on Pearl Harbor plunged the nation into a second war of world-wide magnitude. It was a crucial period in which the production problem facing the country in successfully prosecuting the war was acute. New plants were built and old plants expanded, but the problem of staffing them with adequately trained personnel proved a serious one for some time.

Many School of Engineering students went off to war, and a number of its faculty went to work in war production plants. The School in turn put its academic and laboratory facilities to work in training war production workers for private industry. There were wartime short courses for shop, business and professional people, late afternoon and evening classes, Saturday and Sunday classes, courses and classes which turned out welding and drafting technicians, electrical and electronics communication technicians, and radio technicians.

In this effort, the School joined forces with an even greater number of industries than had heretofore been represented on its advisory councils.

5

1943
1952

PREPARING FOR EXPANSION

Rapidly increasing enrollments, augmented by the influx of World War II veterans, necessitating expansion in equipment, laboratories, faculty and the acquisition of more buildings, marked the fifth decade of the School's operation. Significant, too, was the momentum generated by the approach of the half-century point in its operation, culminating in the 50th anniversary development program.

The death of its founder who led the institution for 45 years, and the election of a new administration to carry on the work structured on the ideals he established, were likewise key factors in this period.

In October 1943, with the MSOE Associated Alumni Endowment Foundation, Inc. as sponsor, the School was elected to affiliate institutional membership in the Society for the Promotion of Engineering Education, which later became the American Society for Engineering Education. In January 1944, the School became affiliated as a charter member of the newly organized National Council of Technical Schools.

A pilot electronics major program developed by Dean Fred J. Van Zeeland was offered in the college electrical engineering course in 1943, and in 1945 the program was offered in the 2-year technician course as well. This same year, the electrical engineering degree course offered a machinery major for the first time.

The 25th anniversary of the College of Engineering was commemorated in 1945 and a career survey of its graduates through the years undertaken. The results were published as an Alumni Roster. Special note was made therein of the Alumni Counselor Program, a concept introduced in May 1944 by Edward J. Rogers, BS EE '20. The Program's purpose, to provide information about the School to high school graduates and men in industry seeking technological or engineering careers, has become increasingly effective in attracting qualified students to MSOE. Alumni counselors, located in many cities throughout the United States and in a number of foreign countries, serve as personal liaison between the School and their communities. Alumnus Rogers, president of Layne-Northwest Company, is a member of the MSOE Corporation and the Board of Regents.

In 1946, the Annex Building was constructed adjoining the Broadway Building to house the re-

1943
1952

Top left, Mr. and Mrs. Oscar Werwath at their home in the early nineteen forties. (Left, below) In 1946, a reunion of students who attended the School during the 1903-1911 period brought a number of Winnebago Street alumni and faculty together again. Mr. Werwath is seated in the front row, center. To his right is Edward J. Rogers, '20, who initiated this reunion. At his left is K. L. Hansen, then Chairman of the Industrial Advisory Committee. Walter Werwath, for many years secretary and treasurer, is seated front row left, and Karl O. Werwath, then vice-president, is standing third row, left. Grouped with them are many of the Winnebago Street alumni listed below with their 1946 affiliations:

Alfred G. Addler '10, electrical inspector, City of West Allis; Werner E. Armstrong '12, research, design, development, Briggs & Stratton Corp.; Walter O. Baer '17, supervising electrical engineer, Cutler-Hammer, Inc.; Aaron C. Bocher '13, superintendent, electrical engineer, Herman Andrae Electrical Co.; Adolph Bullerjahn '09, president, A. D. Bullerjahn Co.; Fred Butzin '10, planning engineer, Falk Corp.; John J. Geder '12; secretary-treasurer, Artos Engineering Co.; Edward J. Gielens '11, chief inspector of equipment for navy and armed forces, A. O. Smith Corp.; Walter E. Hennig '12, manager, electric repair and service, Clark Mfg. Co.; Joseph J. Hushek '12, superintendent and treasurer, Wesley Steel Treating Co.

Henry G. Kettner '11, master mechanic, Milwaukee Solvay Coke Co.; Grover E. Kruecke '20, electrical inspector, City of Milwaukee; Arthur L. Krumhaus '06, chief electrical engineer, Globe Steel Tube Co.; Henry Kuehnel '10, architect; George J. Lexa '13, electrical engineer, Cutler-Hammer, Inc.; Conrad C. Lindner '12, shop maintenance foreman, The Transport Co.; Edwin W. Lueders '12, vice-president and sales manager, Western Machine Co.; Robert Olson '12, electrical engineer, Allis-Chalmers Mfg. Co.; William C. Peters '03, estimating engineer, Harnischfeger Corp.; John P. Praxel '15, chief draftsman, Allis-Chalmers Mfg. Co.

August J. Raasch '09, designing engineer, Harnischfeger Corp.; Alfred Rohn '20, president, George F. Rohn Co.; Fred L. Schauz '13, electrical contractor; Paul L. Schulz '10, supervisor, electrical department, City of Milwaukee; Otto Schwahn '12, building superintendent, Northwestern Mutual Life Insurance Co.; William J. Skelton '11, wire chief, Wisconsin Telephone Co.; Frank Tschernitz '15, chief electrical designer, The Milwaukee Electrical Railway & Light Co.; Joseph W. Wacker '13, president, Sterling Tool & Mfg. Co.; Rud. C. Wilke '11, secretary, Trester Service Electric Co.; Fred B. Wutschel '07, inspector, Artos Engineering Co.

(Right, above) The 40th anniversary of the founding of the Milwaukee School of Engineering and the 25th anniversary of the chartering of the College of Engineering were commemorated in 1945 in a program held at the Public Service Building auditorium of the Wisconsin Electric Power Co. The address of the day was given by Dr. Henry T. Heald (left), then president of Illinois Institute of Technology and currently president of the Ford Foundation. With him are Mr. Werwath (center) and Walter Harnischfeger, then president of Harnischfeger Corp., and a member of the MSOE Board of Regents. *Milwaukee Journal photo.*

---

frigeration, heating and air conditioning laboratories. A temporary structure was put up in 1947 at the corner of Milwaukee Street and Highland Avenue, adding classroom space and housing machine shops and a small internal combustion engine laboratory. The Milwaukee Street Building was acquired in 1948 and, shortly after, a service building was constructed near the D Building.

Mr. Oscar Werwath, the School's founder, principal, president and guiding spirit for almost 45 years, died on March 20, 1948. Tributes paid to his work, to his achievements, to his ideals and his humanity a few years previously on the occasion of the School's 40th anniversary commemoration, were recalled by his many friends and associates in the community and nation at the news of his

O. W.'s Boys

FROM farm and hamlet, countryside and town,
They came to him, as youth,—without renown.
Naive they were, untrained for World's competing strife
Yet craving that which would help them in this life.

He welcomed all with his brusque and austere way,
Each one he knew and analyzed without delay.
Their needs were his, and faults were an open book to him
Boys he knew and they were his, to teach and guide for an
interim.

Of himself he gave, his energy, wealth and all that people prize
He taught them, led them and counselled in manners wise
So from those boys, that crude untutored clay
Came men of logic, understanding the world as it is today.

He is gone from this mortal realm to a higher sphere,
Receiving that reward so justly earned while here.
But his deeds will live, his life goes on through all his boys
We salute his memory, for it is one of our great joys.

Alumnus Charles R. Lund, EE '19, Hon EE '46, wrote this tribute for the May 1948 issue of the School publication, *Transmitter*.

passing. At the 40th anniversary dinner on April 22, 1945, Henry T. Heald, president of the Illinois Institute of Technology, made these observations:

"Forty years is a long time in the life of one individual and even in the life of an educational institution. Few men are given the privilege of founding and guiding an educational program for anything like this period of time. Our meeting today is significant because it marks the first 40 years of the Milwaukee School of Engineering. It is even more significant because it commemorates forty years of steadfast devotion on the part of your founder and president, Oscar Werwath. . .

"Forty years ago technical education was in its infancy. Engineering education had gained a substantial place in the colleges and universities of the country, but the technical institute type of education, as we define it today, was almost unknown. During the succeeding years, with the advancement of engineering knowledge, the increasing industrialization of the country, and the growing complexity of industry, there has been a gradual increase in the recognition of the importance of the technical institute as an essential part of our educational system.

"I am sure that as Trustees, faculty and alumni of Milwaukee School of Engineering, you are anxious to see your institution continue and grow to greater usefulness to the community. You have forty years of service behind you. You have an educational program very much needed in an industrial society. The sustained support and careful development of this program in the technical institute field will pay rich dividends in the lives of successive generations of young men in the years to come, and will give lasting satisfaction to those of you who participate in it."

The tribute of the Board of Regents in memoriam to Mr. Werwath was written by William George Bruce, lifelong friend, member of the Advisory Board, the Corporation and Board of Regents, at the time president of the Bruce Publishing Company and president of the Milwaukee Harbor Commission. It read:

"Some forty years ago Oscar Werwath came to Milwaukee from East Prussia, Germany, to seek a home in the new world. He recognized the fact that he had come to a land of opportunity and freedom. With the background of a schoolmaster mind, and the urge to render a service to his fellowman, he soon formulated an idea as to the nature of his plan of life. Thus, a dream sought reality in a type of school which would afford technical training to young men who sought an industrial career.

"The beginning of his project was a meager one. The number of students was small, the equipment at his command was limited. The basic strength was centered in his enthusiasm, his adherence to an ideal and his persistency and untiring energy in striving toward his goal.

"The results which he gained, with the passing of time, won recognition at the hands of leading industrialists who realized that Oscar Werwath was making a substantial and worthwhile contribution to the mechanical efficiency of his time and day. They came to his support in various ways.

"The one time small school gradually grew to the dignity of an educational institution whose student constituency was drawn from all parts of the civilized world. Aside from a large and well

Karl O. Werwath, left, and Heinz M. Werwath are pictured in 1948 as they assumed their duties as President and Treasurer, respectively, following the death of their father, Oscar Werwath.

orientated school structure, adjacent buildings were secured to accommodate the overflow of students. An efficient faculty was created.

"The founder of the institution had built better than he had contemplated. But he lived long enough to witness the structure he had created, the success he had obtained, and the legacy he would leave for the benefit of mankind.

"The monument he created is not one of bronze or stone but one which must be found in the hearts and minds of the thousands of men who shared in the beneficent gift to them by one who will be enshrined in their memory with gratitude and prayerful thanks."

During the forty-five years of his direction of the Milwaukee School of Engineering as founder, principal and president, more than 34,000 engineers and engineering technicians were educated. The student body paid silent tribute to his memory when stationed as a guard of honor at Forest Home Cemetery where his remains were laid to rest Tuesday afternoon, March 23, 1948.

On April 20, 1948, the Board of Regents elected Karl O. Werwath president of the School to succeed his father. Mr. Werwath graduated from the MSOE College of Electrical Engineering with the Bachelor of Science degree in 1936, and pursued further studies in education, commerce and economics through the Northwestern University Extension and at the University of Wisconsin.

Interest in the School by the new president began even before he was admitted as a freshman when he was employed in stockroom and laboratory maintenance. During his undergraduate years, he had experience in practically every department, particularly in admissions.

On graduation, he joined the staff of the Milwaukee School of Engineering as an instructor in economics in 1936, became registrar in 1938, vice-president in 1946, and acting president during the illness of his father.

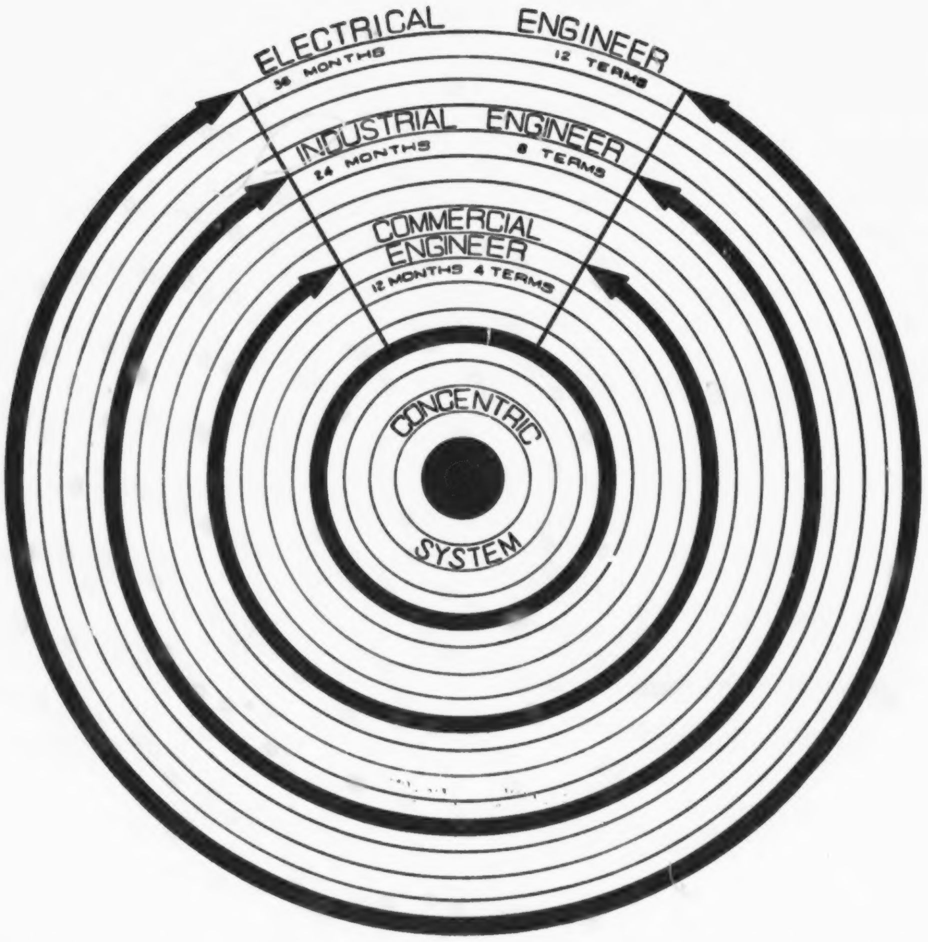
His professional affiliations then included the Society for the Advancement of Education, the American Society for Engineering Education, the Engineers' Society of Milwaukee, and the American Society of Heating and Ventilating Engineers.

Mr. Werwath was elected vice-president of the Milwaukee Junior Chamber of Commerce and was the recipient of its 'Key Man' Award in 1943. He had held the offices of president, vice-president, secretary and treasurer of the Wisconsin Junior Chamber of Commerce, and was national vice-president of the United States Junior Chamber of Commerce from 1943 to 1945. He was also president of the National Council of Technical Schools in 1950-1951.

Heinz M. Werwath was elected treasurer of the School by the Board of Regents at the same time. He graduated from Carroll College in Waukesha in 1938 and was awarded a fellowship for graduate study in business administration at Northwestern University. He served with the Army Air Force from 1942 to 1945. In association with the School since 1939, he was assistant registrar and director of admissions.

Other members of the administration named at the time were Fred J. Van Zeeland, director of the College of Engineering; Sidney A. Eng, director of academic administration; Greta W. Murphy, director of public relations; Mrs. Hannah S. Werwath, assistant treasurer; Hannah W. Swart, registrar; George J. Swart, director of central purchasing; A. C. Schmidt, coordinator; and John H. Murphy, legal counsel.

The new administration served increasing enrollments at the School during the post-war period as many veterans discharged from military service returned either to begin or complete their post-high school education. Indicative were comparative registration figures which rose from 1,152 in the Fall of 1946 to 1,404 in the Fall of 1947, 1,502 in the Fall of 1948, and 1,554 in the Fall of 1949. Cumulative enrollment in 1950 was 2,263.



The School's founder initiated this concept of the Concentric Curriculum with the idea that the student be permitted to progress to the fullest extent of his ability to assimilate programs of higher education. In this period, the course for the Commercial Engineer was a 12-month, 4-term program; the Industrial Engineer a 24-month, 8-term program; and the Electrical Engineer a 36-month, 12-term program.

On October 23, 1948, on the occasion of the School's 45th anniversary homecoming dinner, the new president spoke of the event as one marking the conclusion of a great era and the beginning of another. He described the seal in which are incorporated the symbols which characterize the Milwaukee School of Engineering:

"The periphery is composed of four concentric circles representing the four levels of education which the School serves," said Mr. Werwath. "Symbolized are the vocational, the technician or semi-professional, the engineering at the bachelor's level, and engineering at the professional level.

"The concentric idea stems from the fact that there is a central core in all these levels, a common focal point in the fact that the curricula are fundamentally engineering curricula. From this core emanate a series of terminal levels which provide opportunities for a student to seek his ultimate level and yet be prepared at several intermediate points for specific job opportunities. . .

"A burning torch showing progress by human effort represents enlightenment, understanding and pioneering. This School stands foursquare for these attributes. Book knowledge and the use of the rational processes are symbolized by the open book and creative pen. Here again, our seal symbolizes scholarship. The crossed divider, hammer and flash of electricity indicate the applied phase of the School's work and these three combine to illustrate the areas of service."

The first group winning Bachelor of Science degrees in Electrical Engineering, electronics major, was graduated in 1948. This course, developed by Dean Fred J. Van Zeeland, was designed to present a solid background of the basic sciences and collateral subjects and in addition provide a thorough training in electronics and electronics design. Research and new developments in the industrial application of electronics were forming the broad basis for an entirely new industry at the time.

A 2-year course in radio and television technology was offered in 1949 for the first time, and specialized training programs were offered in the evening division.

William George Bruce, a pioneer associate of the School as a member of its Advisory Board in 1914, later a member of the Corporation and Board of Regents, died in 1949. He was a close friend of Oscar Werwath, the founder.

Another war's outbreak in 1950 cast its shadow over the nation – its homes, its families, its schools. Enrollment at MSOE, as at other institutions, dipped under the impact of President Truman's announcement that the United States was committed to military action in Korea.

Cumulative enrollments dropped to 1,710 in 1951, to 1,299 in 1952, then rose to 1,622 in 1953, the year in which a truce was effected in Korea. The influx of returning veterans was a factor in raising cumulative enrollment to 2,054 in 1954, and to 2,410 in 1955.

The mechanical engineering program was first offered as a four-year curriculum leading to the Bachelor of Science degree in the Fall Quarter of 1952, a development which came about through the genesis of a number of co-related events beginning in 1950.

Industrial Advisory Committees, such as this one for the Refrigeration, Heating and Air Conditioning curriculum, have developed to the point where the School now has 17 committees with over 80 members. Attending this meeting in 1948 were (from left, clockwise) Blaine A. Johnson, consulting engineer; Prof. Ernst S. H. Baars, instructor of air conditioning; Dr. Arthur Simon, consulting engineer; George Balzer, educational advisor; Sidney A. Eng (seated aside), director of academic administration; Thomas Melville, head, Refrigeration Department; Joseph R. Akerman, director, Refrigeration, Heating and Air Conditioning Institute; Irvin J. Haus, Committee Chairman, plant engineer, Nash-Kelvinator Corp.; E. O. Errath, coordinator, the Heil Co.; Henry Dropp, sales manager, Milwaukee Gas Light Co.; John Lofte, designing engineer, The Trane Co.; John H. Murphy, legal counselor and professor of law; and J. Rex Vernon, General Secretary, Industrial Advisory Committee.

In May of that year, at the invitation of the Board of Regents, President Karl O. Werwath arranged a visitation of the Milwaukee School of Engineering by an Advisory Committee, chaired by Dean S. S. Steinberg, College of Engineering, University of Maryland.

The Advisory Committee report offered several alternative procedures. The Board of Regents, on the recommendation of the School administration, decided to expand the institution and make the required substantial investment. Therefore, the establishment of curricula in mechanical technology and engineering was specified as one of three basic objectives of the 50th anniversary development program, for which preparations were being made at the time.

"In making our analysis for the support of industry in this program, we found we could supply, through mechanical engineering curricula, technical and engineering personnel for Milwaukee's heavy goods industries," said President Werwath. "The Board of Regents decided to go all the way. In organizing the mechanical engineering curricula and in developing laboratory facilities, it was possible to start from the beginning and thus build real strength into the program. The procedure permitted utilization of modern developments, particularly in the miniaturization of laboratory equipment. In a very short time this resulted in a very fine program. The Industrial Advisory Committee was particularly helpful in this undertaking."

Thus, beginning with the Fall Quarter of 1952, MSOE was able to offer a series of mechanical engineering and technology courses with service, technician and bachelor of science degree sequence. They included the refrigeration service and heating service courses, the welding operator course, air conditioning technician course, welding technician course, mechanical technician course, and the bachelor of science degree program in mechanical engineering with plant engineering, metal fabrication, or mechanical design majors.

Electrical technology courses offered in 1952 under the concentric curriculum included a 3-month preparatory course, 6-month service courses, 12-month technician courses, and the 36-month sequence leading to the bachelor of science degree in electrical engineering with either the electronics major or the power major.

During 1952, members of the student body organized *Tau Omega Mu* honarary fraternity composed of student tutors. There were five other fraternities, the student congress, and three student technical clubs providing social activities. Facilities were provided for the new amateur radio operators club which had been reactivated in 1949 when it obtained a license from the Federal Communications Commission and the call W9HHX.

The Industrial Advisory Committees were reorganized into specialized groups for each of the School's departments in 1952, with Klaus L. Hansen the General Chairman and J. Rex Vernon the General Secretary. There were twelve committees, one for each of the technologies offered by the School's curricula in electrical and mechanical engineering.

The Harry L. Bradley Visual Aid Theater was opened in 1952. The Oscar Werwath Memorial Fund for short-term student emergency loans, begun in 1948, was now functioning.

The School at this time initiated the "Degree of Associate in Applied Science" to be awarded in the Day and Evening Divisions to students completing certain prescribed courses. A course for the training of industrial supervisors was offered in the Evening Division program.

The 50th anniversary development program, initiated by the MSOE Corporation under the direction of Mr. Walter Harnischfeger, president of Harnischfeger Corporation, was launched in September 1951. Enlisting the interest of industrial associates, business firms and friends of MSOE in the city, state and throughout the nation, the program scheduled the raising and investing of $625,000 over a period of three years with three basic objectives:

MILWAUKEE
SCHOOL OF
ENGINEERING

In rapid succession, the School built an annex to the Broadway building, erected classroom, machine shop, and service buildings, and acquired the Milwaukee Street building (above), to serve the hundreds of World War II veterans returning to complete their education.

1943
1952

1. To develop and improve present programs, buildings, laboratories, student services and facilities (1951 - 1952);
2. To establish curricula in mechanical technology (1952 - 1953);
3. To expand facilities in applied research (1953 - 1954).

Concurrently, the Alumni inaugurated a parallel $25,000 program to establish and develop an adequate library facility, under the chairmanship of Howard L. Greusel, '33, president of the Associated Alumni Endowment Foundation, Inc., and project engineer at AC Spark Plug Division of General Motors Corporation.

The 50th anniversary development program was the result of a three-year study authorized by the Board of Regents as to the direction in which the School should proceed in the post-war period.

Under the guidance of Mr. Harnischfeger, then Vice-chairman of the Board, the development program realized $225,000 by the end of 1952, and the completion on schedule of the first of its three phases.

On becoming Chairman of the Board, Mr. Harnischfeger was succeeded as Vice-chairman by Mr. Frank T. Frey, vice-president of Geuder, Paeschke & Frey Co. Mr. Frey became chairman of the 50th Anniversary Development Committee for the second phase of the program and, together with Mr. Harry G. Hoffman, president of Hoffman & York, Inc., who spearheaded the Wind-up Drive in 1953, successfully completed this phase with an additional $200,000 realized.

The third and final phase of the program, the Mechanical Technology Building Project, was likewise successfully completed under the chairmanship of Mr. Fred F. Loock, president of the Allen-Bradley Company.

Assisting in all phases of the development program were industrialists, businessmen and friends of the School throughout the city and state, many of whom became members of the MSOE Corporation. At a meeting held September 19, 1951, sixteen new members were elected, bringing the total to thirty-six. The newly elected were:

Dudley B. W. Brown, President
  Milwaukee Gas Light Co.
George J. Callos, Executive Vice-president
  Klau-Van Pietersom-Dunlap Associates
A. F. Gallun, Jr.,
  Milwaukee industrialist
Frank W. Greusel, President
  The Greusel Distributing Corp.
Joseph F. Heil, President
  The Heil Co.

Hans U. Hjermstad, President, Electro-Seal Corp.,
Des Plaines, Illinois
Harry G. Hoffman, President
Hoffman & York, Inc.
Roy W. Johnson, President
A-P Controls Corp.
Charles H. Klingler
Milwaukee manufacturer
James H. Kuehn, Vice-president
Wisconsin Cold Storage Co.
T. O. Liebscher, Vice-president
Le Roi Co.
James B. Morrison, President
Wisconsin Telephone Co.
Harold P. Mueller, President
L. J. Mueller Furnace Co.
E. W. Seeger, Vice-president in charge of
development, Cutler-Hammer, Inc.
J. H. Smith, General Manager
X-Ray Department, General Electric Co.
John Weiland, Works Manager, Milwaukee Body
Plant, Nash-Kelvinator Corp.

Before this expansion, the Corporation included William F. Eichfeld, Chairman of the Board of Regents; Walter Harnischfeger, Vice-chairman; John Herzfeld, Secretary; Karl O. Werwath, President of MSOE; and Heinz M. Werwath, Treasurer. Other members were:

Walter F. Dunlap, President
Klau-Van Pietersom-Dunlap Associates
Frank T. Frey, Vice-President
Geuder, Paeschke & Frey Co.
Klaus L. Hansen
Consulting Engineer
George F. Kasten, Vice-president
First Wisconsin National Bank
M. J. Maiers, Manager, Sales Service Dept.
Commonwealth Edison Co., Chicago
Greta W. Murphy, Director, Public Relations
Milwaukee School of Engineering
John H. Murphy, Attorney
Schmitz, Wild and Gross
A. C. Schmidt, Coordinator
Milwaukee School of Engineering
George J. Swart, Director, Central Purchasing
Milwaukee School of Engineering
Hannah W. Swart, Registrar
Milwaukee School of Engineering
V. Robins Tate, Executive Vice-president and
Secretary, Perfex Corp.
J. Rex Vernon, Secretary
Johnson Service Co.
C. O. Wanvig, Jr., Vice-president
Globe-Union, Inc.
Hannah S. Werwath, Assistant Treasurer
Milwaukee School of Engineering
Arthur A. We[illegible] President
Wetzel Brothers

In 1952, Mr. Harnischfeger was elected Chairman of the Board of Regents, succeeding Mr. Eichfeld who had served in that capacity since its organization in 1932. Mr. Frey was elected Vice-chairman.

The success of the development program began in this period and the investment of the resources realized, placed the Milwaukee School of Engineering on a firm financial foundation, attaining the over-all objective of Mr. Harnischfeger in planning the program. The brochure on the project stated:

> "The Milwaukee School of Engineering enters its fiftieth year with maturity and stature to which the 50th anniversary program is adding the necessary financial strength. . .The challenge of the future is to keep costs to the student sufficiently low to enable the young men who seek this type of education to obtain it, thus supplying from the ranks of the untrained the type of skilled personnel so sorely needed in our economy."

The 1943-1952 period in the School's history was notable in the impression of maturity made by veterans enrolling after military service.

During the decade, the new administration with youth and objectivity, lifted the School to a new level of achievement made possible through the enthusiastic support of the institution's industrial associates.

Practically every week the Milwaukee School of Engineering is host to visitors from foreign lands — educators, administrators, and students — studying American educational practices. One such visitor in 1949 was Radha Charan Das of Aska, Orissa Province, India, who was touring the United States to study electrical curricula in technical institutes. Greeting him is Dean Fred J. Van Zeeland (right).

The School always has attracted students from many foreign countries and U. S. Territories. Pictured below are over 50 Hawaiian students at an October, 1949, get-together to hear news of their island homeland from Edward N. Loftus of the Honolulu Star Bulletin, a daily newspaper.

6

1953
1963

BUILDING FOR THE FUTURE

The first annual Founder's Day observance on May 4, 1953 was a major event marking the golden anniversary of the Milwaukee School of Engineering. Nearly 300 industrialists, civic leaders and friends attended the anniversary dinner and heard H. I. Romnes, chief engineer of the American Telephone and Telegraph Company, laud the School for its contributions to Milwaukee and national industrial might.

There were other anniversary highlights. The School admitted its 50,000th student. The Board of Regents and MSOE Corporation signalized the anniversary by authorizing 50 scholarships and grants-in-aid totalling $50,000 to prospective students for the 1953-'54 academic year.

The golden anniversary edition of the School's annual catalog, produced by its Public Relations Division, won top honors in merit at the 1953 convention of the American College Public Relations Association held in Salt Lake City.

It was also in 1953 that the first Associate in Applied Science degrees were conferred on graduates of the 18-month courses in radio and television, and in air conditioning technology.

On the administrative staff, Heinz M. Werwath was elected Vice-president while retaining his duties as Treasurer.

In 1954, the MSOE Auditorium at the corner of State and Milwaukee Streets was purchased and remodeled to serve as the School's main lecture hall and provide additional classroom space for the teaching of English, the humanities and social sciences. The former auditorium in the Milwaukee Street building was remodeled to house the Alumni Technical Reference Library.

In March of the following year, the Engineering Laboratories Building at the southwest corner of State and Milwaukee Streets was purchased and equipped.

Walter Harnischfeger, who had been Chairman of the Board of Regents since 1952, was named Honorary Chairman in 1955, and Edwin W. Seeger, vice-president of Cutler-Hammer, Inc., Chairman. In October, on the death of Mr. Seeger, Fred F. Loock, president of the Allen-Bradley Company, became Chairman.

The objectives of the 50th anniversary development program, begun in 1951, were realized in 1955

(right) A bronze bust of Oscar Werwath, founder of the Milwaukee School of Engineering, was unveiled May 4, 1953, at the first Founder's Day dinner marking the 50th Anniversary of the School. K. L. Hansen, Regent and intimate friend of Mr. Werwath, is shown with Mrs. Hannah S. Werwath who unveiled the bust of her late husband. The bronze cast is the work of sculptor George A. Dietrich, Madison, Wisconsin. It was donated to the School by Regent and Mrs. John H. Murphy, members of the MSOE Corporation. In the background are some of the portraits of 40 industrialists, businessmen and educators who were instrumental in the School's development. The portraits were dedicated at the time and now hang in the School's administrative quarters. *Milwaukee Journal photo.*

(page 47, upper) Dr. Wilson M. Compton (center), president of the Council for Financial Aid to Education, Inc., New York, was the speaker at the 1955 Founder's Day dinner. He is shown here with (from left) E. W. Seeger, then Chairman of the Board of Regents, President Karl O. Werwath, and Vice-president Heinz M. Werwath.

(page 47, lower) In October, 1955, on the death of Mr. Seeger, Fred F. Loock, president of the Allen-Bradley Co., was elected Chairman of the Board of Regents. This picture of the quarterly meeting taken at the time shows (seated from left) V. Robins Tate, executive vice-president, The Perfex Corp., and Secretary of the Board; Mr. Look; Regent K. L. Hansen, consulting engineer; (standing from left) Heinz M. Werwath, Vice-president and Treasurer of MSOE; Regent John H. Murphy, Assistant Secretary of the Board and legal counselor; President Karl O. Werwath; Regent Harry G. Hoffman, president of Hoffman-York, Inc.; and Regent A. C. Schmidt, MSOE coordinator.

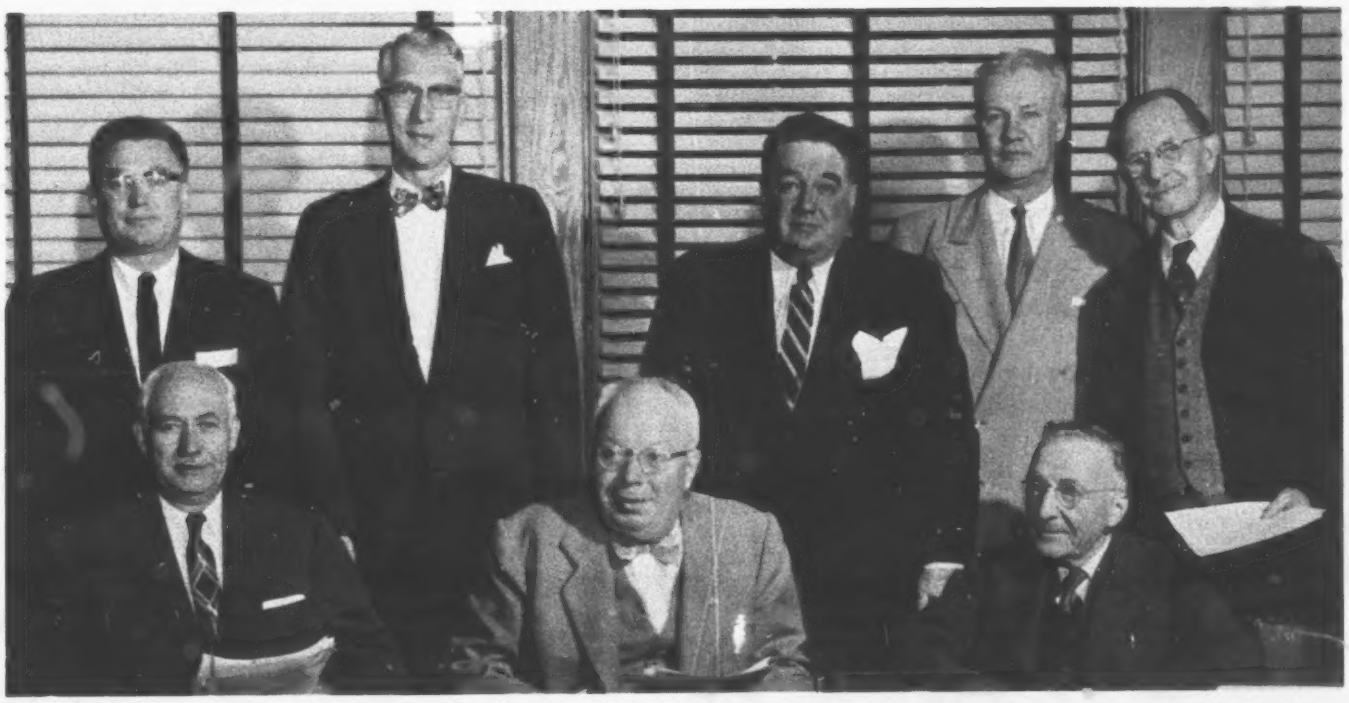
---

with the raising of $625,000. The Board of Regents allocated sums from the fund for various essential projects and services. Among them were the provision of equipment for the mechanical engineering laboratories, and for the electronics, television and electrical laboratories, the elimination of prior building indebtedness, the development of classrooms, alumni library, Harry Bradley Visual Aid Theater, and other facilities.

Also authorized was the creation of a fund for the establishment of a faculty tenure program, the augmenting of faculty salary schedules, and the establishment of student loan and tuition grant programs.

In July, MSOE acquired charter membership in the newly established Technical Institute Foundation, Inc., in Boston. Karl O. Werwath was elected first president of the foundation, and Regent John H. Murphy, who prepared the articles of incorporation and by-laws, was named a trustee. President Werwath was also elected chairman of the Technical Institute Division of the American Society for Engineering Education at the 1955 annual meeting. He had formerly served as vice-president two two-year terms, and secretary-treasurer for two two-year terms.

At this time, the School published a five-year placement report prepared by its Relations with Industry Division. The report contained a summary of the first job placement record of all graduates from the four major curricula of the MSOE Day Division between December 1948 and December 1953.



During this five-year period, 1,097 students graduated with either bachelor of science degrees or technician certificates. Their homes were in 46 states, the District of Columbia, Hawaii, and 14 foreign countries. The survey showed that nearly 90 per cent of these graduates were placed properly in a wide variety of technical and engineering positions by the MSOE Relations with Industry Division; 963 of the 1,097 received their first jobs through this service. Others entered the armed forces after graduation, some continued study for advanced degrees, seven returned to their homes in other lands, and 18 had previous commitments, thereby not requiring the services of the School's Relations with Industry Division.

A ten-year placement report was published in 1959. This, along with succeeding annual reports, confirmed the continuing picture of MSOE placement assistance to graduates and alumni.

During 1955, extensive refurbishing of the plant was achieved. The exteriors of all stone and brick buildings were sand-blasted, tuck-pointed and sealed. A new advanced electronics circuitry and thesis laboratory was developed on the lower floor of the Broadway Building. The electrical machinery and controls laboratory and the fractional horsepower laboratory were expanded and relocated in the new Engineering Laboratories Building, and the main electronics laboratories in the Broadway Building were completely air-conditioned.

The School has developed a well-balanced testing program to aid in the screening and selection of students applying for admission and to provide a basis for the counseling and guidance of students after enrollment. Applicants for admission are given mental ability and pre-engineering ability tests, and mathematics placement examinations. The American College Testing Program in English, social science, and natural science, is another instrument in the MSOE guidance program. Senior students may write a complete battery of tests under the Milwaukee Plan of Aptitude Testing to determine their specific interests and aptitudes in the field of engineering. These tests have confirmed the stability and capacity of the MSOE graduates as a whole.

Other student services offered include selective service and veterans affairs counseling, foreign student advisory programs, housing, the coordination of technical societies, social fraternities, and special interest clubs, all under the Student Affairs Division. Supervision is also provided for student committees planning the Homecoming and St. Patrick's Day observances, the all-school picnic, and the intramural sports program.

In April, 1956, President Eisenhower set up The President's Committee on Scientists and Engineers to assist the Federal Government in identifying the problems associated with the development of more highly qualified scientists and engineers. Its membership included the presidents of nineteen major organizations in science, business, education, government and labor.

One of the major groups assembled by the Committee to assist in accomplishing its mission was the Working Committee for the Development of Supporting Technical Personnel with President Karl O. Werwath of MSOE as chairman. The Committee's report stated, among other factors, that the shortage of competent technical personnel in this country emphasizes the necessity for training and upgrading currently employed technical people at all levels.

The Industrial Advisory Committees developed new programs in the electrical and mechanical areas in 1956. A 2-year program in electronic communications technology replaced the radio and television course, and a communications option replacing the electronics option was adopted for the Bachelor of Science degree in Electrical Engineering. In the mechanical area, a 2-year course in industrial technology replaced mechanical technology.

The first degrees of Bachelor of Science in Mechanical Engineering were conferred in 1956, when the cumulative enrollment in the Day Division was 2,576 and 831 in the Evening Division.

Early in 1957, the MSOE Corporation Self-Study Committees recommended the preparation of a second Development Program, a broad pattern for the "MSOE of Tomorrow" in the concept of Technology Park.

To aid the Board of Regents in setting a goal for the first phase of the program, to be completed in June of 1960, Marts & Lundy, Inc., fund-raising consultants, were retained to survey 100 leading local industrialists through personal interviews.

From the results of this survey, the Board of Regents approved a $1,150,000 first phase goal to:

1. Purchase and equip the Metals Laboratories Building;
2. Complete and add additional equipment to the Engineering Laboratories Building;
3. Erect a new Science Building;
4. Acquire land and provide for architectural planning and furnishings for a new dormitory;
5. Begin an endowment fund for greater teaching.

"If MSOE is to serve properly," wrote President Karl O. Werwath, ***"It must of necessity project its plans to accept its share of the oncoming college enrollment load in conformation with the national challenge to all institutions of higher learning. Key factors in these plans are future developments for greater teaching and for physical plant expansion, each an imperative essential in coping with anticipated increases in student enrollments in MSOE Day and Evening Divisions."***

The completion of the Engineering and Metals Laboratories Buildings in 1957 increased MSOE laboratory space by approximately 25,000 square feet. The Engineering Laboratories Building, providing 16,000 square feet of floor space, housed the Department of Mechanical Engineering faculty office, mechanical engineering and technology laboratories for heat power, diesel and internal combustion engines, as well as an electrical engineering faculty office, stock rooms, an electrical shop, DC and AC motors and controls, and fractional horsepower laboratories.

RADIATING PRODUCTIVITY

The theme of the second MSOE Development Program, 1957 to 1960, was "Radiating Productivity." The first copy of the brochure on the program's objectives was presented to Walter Harnischfeger, Honorary Chairman of the MSOE Board of Regents and Chairman of the Development Program Steering Committee, by President Karl O. Werwath.

A new addition to the MSOE technical center was the Metals Laboratories Building which added 9,500 square feet of floor space. Located on the southwest corner of Broadway and State Streets, the building housed the mechanical engineering faculty office, a foundry, classrooms, and laboratories for mechanical design, welding, materials testing, and metallurgy.

In 1957, the School gained two additional buildings, the Engineering Laboratories Building (upper) and the Metals Laboratories Building. These made possible the launching of the programs in mechanical engineering and technology.

On November 22, 1957, the Milwaukee School of Engineering sponsored a convocation on the Role of the Engineering Technician in Supplying Technical Manpower for America. Participating in the discussions which attracted more than 1,000 guests were Dr. Howard L. Bevis, chairman of The President's Committee on Scientists and Engineers; G. Ross Henninger, director of the national survey of technical education conducted by the American Society for Engineering Education; Noah E. Hull, chairman of the Professional Engineers Conference Board for Industry; Robert D. Teece, general chairman of the MSOE Industrial Advisory Committee; and William J. Grede, president of Grede Foundries, Inc., who was convocation chairman.

In 1957, 17,247 requests for course information were received, 1,834 applications for admission were filed, and 968 new students were admitted. During the year, MSOE admission counselors visited 400 high schools in the midwestern states, talking to about 5,000 high school students about careers in engineering. More than 4,800 persons, parents, teachers, prospective students, visited MSOE in 1957 for tours and educational counseling.

The Day Division had a cumulative enrollment of 2,393 students originating from all 48 states, 4 U. S. territories, and 26 foreign countries. During the year's two semesters, 997 Evening Division students representing over 180 different companies were registered.

Industrial Advisory Committee activities were concentrated during the year on the development of the new computer technology program and the required specialized laboratories.

Alumnus and Secretary of the Board of Regents V. Robins Tate, '27, was named winner of the annual James H. McGraw electrical manufacturers' award in 1957. He had served as president of the Engineers Society of Milwaukee in 1947-1948.

The 2-year course in computer engineering technology was added to the curriculum in 1958. The mechanical technology and engineering programs were modified to provide a common basic study stem for the Associate in Applied Science and the Bachelor of Science degree programs. A 2-year program in metallurgical engineering technology was also added, and the Bachelor of Science in Mechanical Engineering program was consolidated to a 4-year program.

In 1958, MSOE added to its list of affiliations an active membership in the American Association of Junior Colleges. It also became an institutional member of the National Commission on Accrediting.

At the November, 1957, convocation on engineering technicians, speakers were (left to right) Robert D. Teece, executive engineer, Harnischfeger Corp., and Chairman of the MSOE Industrial Advisory Committee; Noah E. Hull, assistant to the vice-president, manufacturing, Hughes Tool Co., Houston, Texas; G. Ross Henninger, associate director, Engineering Extension, Iowa State College, Ames, Iowa; and William J. Grede, president, Grede Foundries, Inc., Milwaukee.

In October, the first in a series of new television programs titled "Challenge" was presented with the combined sponsorship and preparation of the Milwaukee School of Engineering, television station WISN-TV, and the Milwaukee area industries. The program, which has endured as a continuing feature, is designed to inform young people, their parents and teachers, about current and future opportunities for engineers and engineering technicians. MSOE, in cooperation with radio station WISN, began in the fall of 1960 a series of public service radio programs known as "Sounds of Engineering Science." The programs, broadcast thrice-weekly, are five-minute capsule discussions by faculty members on various aspects of scientific knowledge.

In December, 1958, the current administration completed its first decade and reviewed ten major achievements significant of the School's expanded services during that period.

"Around these are many additional satellite accomplishments involving teams of students, faculty, staff, industrial advisors, regents, Corporation members, alumni, and friends," wrote President Werwath in the December Newsletter. "To these individuals goes the salute for real accomplishment in effecting these advancements:

"1. ***The establishment of the Technical Reference Library.*** Now in its tenth year, this alumni-supported project is growing steadily in size and stature, and has made a marked improvement on the total scholastic achievement of the student body. A far-reaching research project, involving eleven theses teams, will result in a master list of books required to bring this library to full service.

"2. ***The accrediting of the technical institute programs by the Engineers' Council for Professional Development.*** Received on November 3, 1948, this recognition was among the earliest given technical institute programs in the United States. It was the first and still is the only such accreditation in the State of Wisconsin.

"3. ***The 1953 50th anniversary $625,000 development program.*** This significant project, the first of its kind in this history of the School, provided a sound financial basis and established the foundation for most of the subsequent accomplishments of the decade. The project was inspired and paced by the then Chairman of the Board of Regents, Mr. Walter Harnischfeger.

"4. ***The Bachelor of Science Degree program in Mechanical Engineering.*** The establishment in 1953 of the full four-year curriculum in mechanical engineering, financed through the 50th anniversary program, enhanced the existing mechanical and electrical programs at both the technical and engineering levels. Nationwide, the first MSOE ME graduates are making a substantial reputation for themselves and the School.

"5. ***The adoption of an adequate pension and tenure program, and the financing of support for faculty academic development.*** Begun under the 50th anniversary development program, this plan has been eminently successful in stabilizing our faculty and has been a means of attracting a brilliant, young supporting staff of instructors.

"6. ***The upgrading of admission requirements.*** Since all certificate and degree curriculum in the Day Division of the School are now in the area of higher education, the upgrading of admission standards to this level of study was essential. This project has reflected favorably in the status of the students and the reputation of the institution in both the Day and Evening Divisions. The Preparatory Program is being continued as a separate service for students of ability who need to correct academic deficiencies before being admitted to a technical institute or collegiate engineering program of study.

"7. ***The self-study by the Board of Regents and faculty.*** In recent months, members of the Board of Regents and the Corporation, aided by the faculty and students through prescribed theses, have made a determined self-analysis. Based on these findings, new horizons in academic and personal services are envisioned for MSOE in a greater physical plant symbolized by 'Technology Park'. This expansion around the present facilities in the heart of downtown Milwaukee will provide the institution with a campus which will be an asset in the achievement of our objectives – radiating productivity in the areas of technology, engineering, science and engineering economy.

"8. ***The 1957-1958 $1,150,000 development programs.*** Under the direction of Mr. F. F. Loock, Chairman of the MSOE Board of Regents, and supported by over 300 industrial firms and individual donors, the current financial program for the development of our physical plant is an important step in meeting current and future needs for advanced higher education in technology, especially in the area of the physical sciences. Mr. Harold F. Falk is Chairman of the Leadership Gifts committee; Mr. George C. Bitters is Chairman of the Special Gifts committee; and Mr. Henry J. Dropp is Chairman of the Popular Gifts committee.

"9. ***The establishment of the MSOE Endowment Fund for great teaching.*** Launched by our alunmi to finance faculty pension and tenure programs, and eventually to endow key academic chairs, this $1,000,000 ten-year project is a tribute to the teachers who made such great contributions through the decades. It is part of the current development program, with an initial three-year goal of $150,000. This project is sparked by alumnus E. J. Rogers, '20.

"10. ***The expanding student interest in professional affairs.*** Joining the 30-year-old MSOE student branch of the American Institute of Electrical Engineers are a series of student chapters of other national professional societies. This development will be highly significant in years to come as membership in these groups brings to the student body increased growth in personal character through a broadened sense of professional, civic and social responsibilities."

In 1958, Mr. Loock was selected as the initial recipient of the Outstanding Citizen Award presented by the Sales Executive Club of Milwaukee. President Werwath received the James H. McGraw Award in Technical Institute Education for 1958. Sponsored by the McGraw-Hill Book Company, Inc., this annual award for distinguished contributions to the field of technical education is administered by the Technical Institute Division of the American Society for Engineering Education.

The 1958 Day Division cumulative enrollment was 2,399 from 48 states, 2 U. S. territories, and 24 foreign countries. Included were 31 U. S. Army personnel selected from Ordnance Corps, Signal

In the Summer and Fall Quarters of 1958, the first contingent of U. S. Army students from Ordnance Corps, Signal Corps, and Adjutant General units arrived for 2-year programs of specialized instruction in electronics for guided missile and special weapons assignments. Nearly 100 students have taken part in the program since its inauguration. *Milwaukee Journal photo.*

Corps, and Adjutant General Units for 2 years of specialized instruction in electronics for guided missile and special weapons assignments. The Evening Division registered 1,050 students representing 190 firms.

A ten-year report on the School's finances showed that operating income increased from $806,101 in 1949 to $1,375,648 in 1958, while operating expense rose from $732,632 in 1949 to $1,401,494 in 1958. The cost per student in 1949 was $585; in 1958 it was $1,088.

As of December 31, 1958, the MSOE educational plant occupied a total of 110,200 square feet of floor space. Included in this area were 32 specialized technical laboratories and 30 classrooms, plus the auditorium, book store, cafeteria, technical library and reading room, student lounge, visual aid theater, administration and faculty offices.

Student organizations were increased to 15 during 1958, with the addition of two new technical and three new professional societies. To serve in an advisory capacity for all groups, the Student Life Council was organized with representatives from the Inter-Fraternity Council, Student Congress, the Faculty Advisors Council, and the Division of Student Affairs.

The 1959-1960 General Catalog listed 19 student organizations at MSOE grouped in five general categories:

Professional-Technical – Student Branch of the American Institute of Electrical Engineers, Student Branch of the Milwaukee Chapter of the American Society of Mechanical Engineers, Student Associate Branch of the Institute of Radio Engineers, Student Club of the Society of Automotive Engineers, and the Student Professional Engineering Society.

Honorary – Tau Omega Mu (juniors and seniors who volunteer to tutor students who need academic help).

Government – Inter-Fraternity Council (representing all fraternities); Student Congress (representing all class sections); and Student Life Council (representing all student organizations, the Faculty Advisors Council, and the Division of Student Affairs).

Interest – Amateur Radio Club, W9HHX; Hi-Fi Club; and the Photography Club.

Social – Alpha Mu Sigma (military students); Delta Alpha Epsilon (mechanical engineering and technology students); Delta Phi Zeta (electrical and mechanical engineering students); Kappa Eta Kappa, Theta Chapter (electrical engineering students); Sigma Pi Rho (electrical engineering students); and Tau Iota Epsilon (all MSOE students).

Also announced were curriculum changes developed by the faculty in cooperation with the

Industrial Advisory Committees. Added to the list of technical electives for engineering students were: two-port networks analysis, digital computers, power systems analysis, advanced differential equations and applications, and introduction to functions of a complex variable.

The humanities and social science subjects, developed over the past decade by the English, the Economics and Industrial Commerce, and other academic departments, were combined in a newly-established Department of Humanities and Social Sciences. Three programs in modern foreign languages, French, German, and Russian, were introduced.

All states, 4 U. S. territories, and 25 foreign countries were represented in the Day Division cumulative enrollment of 2,074 for 1959, while the Evening Division registered 1,058 students.

During the 1959-1960 terms, the National Science Foundation sponsored at MSOE In-Service Institutes in mathematics and modern concepts of physics for high school teachers.

The second MSOE Development Program conducted from July 1, 1957 to June 30, 1960, achieved a major breakthrough in the School's drive for excellence in educational services. The first, the 50th Anniversary Development Program begun in 1951, was designed to develop a sound financial base and broadened educational programs. The purpose of the second was to enhance the physical plant.

Goal of the program was realized with the raising of over $1,000,000 in cash. Other gifts came in the form of laboratory equipment and library accessions.

In September, 1958, the School had acquired a building on the northwest corner of Jefferson Street and Kilbourn Avenue. After extensive renovation, this became its new Allen-Bradley Hall of Science, the cornerstone of Technology Park. The building was dedicated on May 3, 1960. Other projects had been completed earlier with the equipping of the Engineering Laboratories Building and the Metals Laboratories Building.

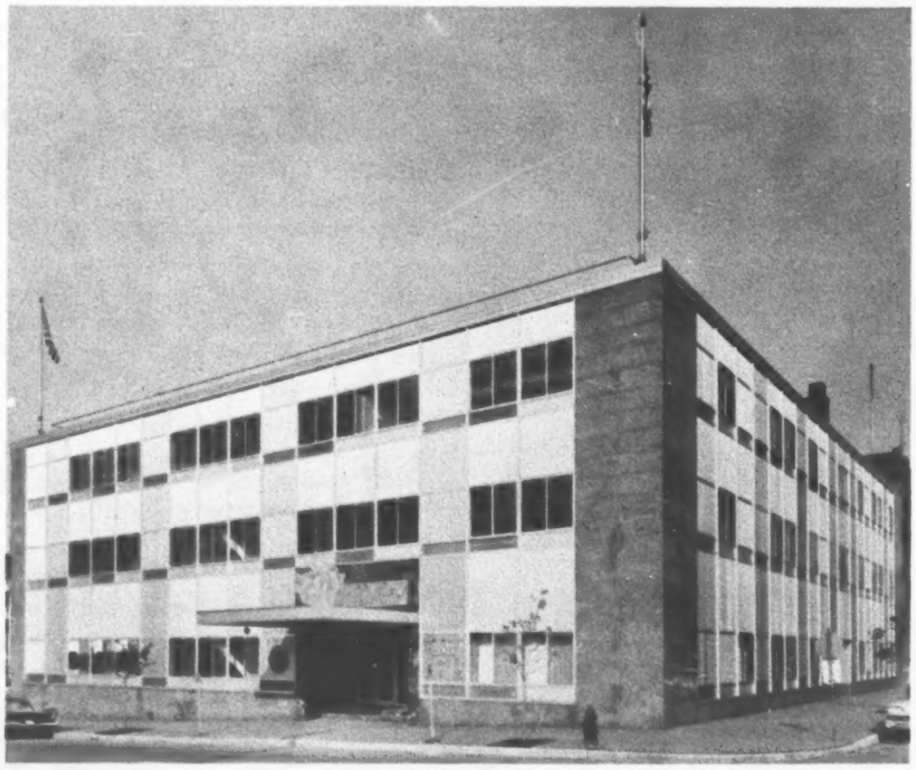
The Allen-Bradley Hall of Science, an ultra-modern, 3-story aluminum and glass structure, provided the School with much-needed classroom and laboratory space. Its south wing, providing some 35,000 square feet of instructional space on three floors, houses two faculty offices, a physics of light and sound laboratory, and a physics of mechanics and heat laboratory on the first floor; four faculty offices, advanced and general chemistry laboratories, darkroom and a modern physics laboratory on the second floor; a computer laboratory, radio receiver and transmitters laboratory, basic and industrial electronics laboratory, and a TV and communications laboratory on the third floor.

At the dedication luncheon, a surprise gift of $300,000 was presented to the School by Harry L. Bradley, Chairman of the Board of the Allen-Bradley Co., and Fred F. Loock, Allen-Bradley President and Chairman of the MSOE Board of Regents. The Allen-Bradley Company had previously given $310,000 to the MSOE $1,150,000 development program, and the additional funds completed the financing of the Hall of Science and equipped the building.

Distinguished guests at the dedication luncheon included the Honorable Henry Maier, Mayor of Milwaukee, who congratulated MSOE on its achievement; Willard E. Downing, Executive Director, Milwaukee Urban Redevelopment Authority; Arthur A. Wetzel, President, Greater Milwaukee Committee and member of the MSOE Corporation; and Alderman Alfred C. Hass, Milwaukee Common Council.

Representing professional societies and engineering educators were E. C. Koerper, President, Engineers' Society of Milwaukee; Foster Koehn, President, Milwaukee Chapter of the Wisconsin Society of Professional Engineers; and Professor Kurt F. Wendt, Dean of Engineering, University of Wisconsin. The engineer-architect, MSOE Corpora-

(above) At the luncheon preceding the dedication of the Allen-Bradley Hall of Science in May, 1960, the speakers' table included (left to right) Fred F. Loock, Chairman of the MSOE Regents; President Karl O. Werwath; Harry L. Bradley, chairman of the board, Allen-Bradley Co.; Vice-president Heinz M. Werwath, Alderman Alfred C. Hass; and Willard E. Downing, Milwaukee Urban Redevelopment Authority. (right) Chairman Loock unveils the plaque at the dedication ceremonies for the Allen-Bradley Hall of Science (below) which houses physics, chemistry, computer, electronics, radio and electrical measurements laboratories, classrooms, faculty offices, the Institute of Leather Technology and the Fluid Power Institute.



tion member Charles A. Nagel, President of Charles Nagel & Associates, Inc., and contractor Robert C. Johnson, President, Siesel Construction Co., also presented greetings at the dedication.

In his address, President Werwath described the Hall of Science as a symbol of the future for MSOE, answering the challenges of the 1960's. "On this reinforced foundation," he said, "we are building an independent, specialized institution of higher learning girded against the pressures of the future."

President Werwath also forecast that the development of MSOE's Technology Park would continue unabated in cooperation with the city's program for redevelopment of the area surrounding the School.

The establishment of the Institute of Leather Technology at MSOE was announced at the dedication by W. R. Lotz, Vice-president in charge of production, Albert Trostel & Sons Co.

After more than 25 years of operation at Lehigh University, the Institute was moved to Milwaukee School of Engineering and its laboratories installed in the Allen-Bradley Hall of Science. Under the direction of Dr. Robert Stubbings who previously had directed the work at Lehigh University, the Institute has the primary objective of studying fundamental leather processes.

It is sponsored by five industrial leather producing companies: Albert Trostel & Sons Co., Pfister & Vogel Tanning Co., both of Milwaukee; S. B. Foote Tanning Co., Red Wing, Minnesota; Fred Rueping Leather Co., Fond du Lac; and Ohio Leather Co., Girard, Ohio.

Studies of the Institute involve applied research in chemical and physical leather processing, development studies in instrumentation and automation, and fundamental research in the chemistry and biochemistry of animal skin.

In addition to this primary leather program, a second main program of research by the Institute provides fundamental studies of chrome tanning for the entire leather industry. This program is sponsored by the Chrome Producers Research Group which includes the Columbia Southern Chemical Division of Pittsburgh Plate Glass Co., Pittsburgh, Pa.; Diamond Alkali Co., Painesville, Ohio; and Solvay Process Division of Allied Chemical Corporation, Syracuse, N. Y.

In the fall of 1962, the School established the nation's first Fluid Power Institute to provide education and research, to conduct seminars, and to publish papers and reports on fluid power development. Professor Russell W. Henke was named director of the Institute, whose affairs are conducted by a seven-man industrial management board.

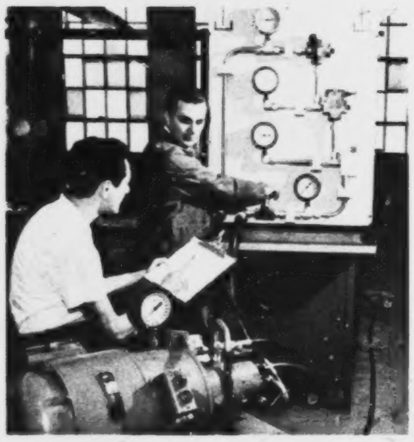
As additional physical facilities become available, an increase in research activities is anticipated. Dr. Stubbings is over-all director of research at MSOE.

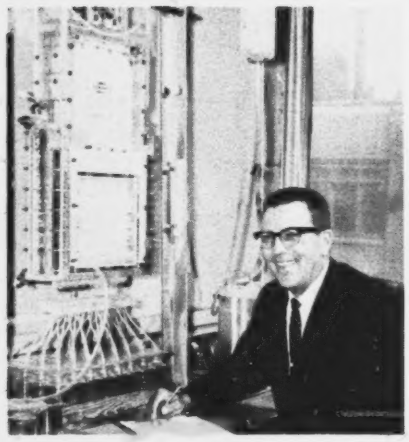
Cumulative annual Day Division enrollment reached a high of 2,578 in 1956, then met a decline that followed a national trend. In 1960, 2,056 students were registered, in 1961, 2,002, and in 1962, 1,824. Engineering enrollments at all U. S. colleges reached a high of 269,000 in 1957. Since then there has been a steady decline to the present present national enrollment of about 240,000 engineering students.

In April, 1961, the Allen-Bradley Student Loan Fund was established with a grant of $250,000 from the Allen-Bradley Foundation.

"This magnificent program virtually doubles our student loan resources," said President Werwath, pointing out that funds available to students through loans now totalled $426,162. This included loans from ten industrial revolving loan funds in addition to the National Defense Student Loan program.

5





(far left) Prof. Russell W. Henke, standing, Director of the Fluid Power Institute.

(near left) Dr. Robert Stubbings, Director of the Institute of Leather Technology.

(left) The Allen-Bradley Student Loan Fund established in April, 1961, by a $250,000 grant from the Allen-Bradley Foundation, is a permanent revolving loan fund administered by a three-man management committee composed of (left to right) MSOE Vice-president and Treasurer Heinz M. Werwath; V. Robins Tate, executive vice-president, Perfex Corp., and Secretary of the MSOE Board of Regents; and attorney Harvey W. Peters, Allen-Bradley Co.

The MSOE Corporation observed the 30th anniversary of its founding in 1961. Citations were presented to charter members Walter Harnischfeger and William Herzfeld in recognition of their 30 years of service to the Corporation.

The School's Dean of Engineering, Fred J. Van Zeeland, a veteran of 35 years of service at MSOE, became Emeritus Dean in July, 1961. He was succeeded by Prof. Richard J. Ungrodt. Emeritus Dean Van Zeeland joined the faculty after graduation at MSOE in 1928. He was named professor of electrical engineering in 1935, and Dean of the College of Electrical Engineering in 1938. He has been chairman of the Committee on Curriculum and Standards, vice-chairman of the Executive Educational Council, member of the Scholarship Committee, the Administrative Commettee, the Admissions and Advancement Committee, the Industrial Advisory Committee.

He has been chairman of the Milwaukee section of both the Institute of Radio Engineers and the American Institute of Electrical Engineers. He was made a Fellow of the AIEE in 1957 "for his contributions as an educator and an administrator." In 1943-45, he organized electronics courses at MSOE at engineering and technical institute level. He was instrumental in the expansion of MSOE courses to include programs leading to the Bachelor of Science degree in Mechanical Engineering.

Prof. Richard J. Ungrodt (left) was appointed MSOE Dean of Engineering on July 1, 1961. A 1941 graduate of MSOE, he has been a member of the faculty for 16 years. He was named head of the Power Branch of the Electrical Engineering Department in 1949; Chairman of the Electrical Engineering Department in 1952; Assistant Dean of Engineering in 1955; Director of the Technical Institute in 1958; and Associate Dean of Engineering in 1959. Dean Ungrodt was elected president of the Engineers and Scientists of Milwaukee, Inc., in June, 1963.

(center) The Executive Educational Council, under the Chairmanship of the Dean of Engineering, meets biweekly to review all questions concerning the curriculum, course offerings, content, adjustments, and revisions. The Council consists of the Chairmen of all academic departments and the heads of the various divisions within the departments. Its members also form the Library Committee, the Teacher Aids Committee, the Core Curriculum Study Committee, the Computation Center Committee, and the Committee on Advanced Degrees and Certificates.

Emeritus Dean Fred J. Van Zeeland (right) is a veteran of 35 years of service at MSOE. He joined the faculty after graduation in 1928, was named Professor of Electrical Engineering in 1935, and Dean of the College of Engineering in 1938. A registered professional engineer in the State of Wisconsin, he was named a Fellow of the American Institute of Electrical Engineers in 1957 "for his contributions as an educator and an administrator." Named Emeritus Dean of Engineering in July, 1961, he continues to teach and supervises a program of young teacher training.

Emeritus Dean Van Zeeland was cited for distinguished service to the School in 1958 and again in 1963. He continues to teach classes in electrical engineering and supervises a program of young teacher education and training.

In May, 1961, President Werwath toured Russia with a special six-man U.S. Technical Education team. Purpose of the month-long tour was to give the educators an opportunity to observe Russia's technical schools, their courses, teaching methods, facilities and techniques, and to observe the placement of graduates. The tour was conducted under the State Department's Cultural Exchange agreement with the Soviet Union.

At the Fall Quarter Commencement in 1960, MSOE Coordinator, A. C. Schmidt, in what developed into a second career, was cited "for more than a quarter century of distinguished service to this institution as friend, advisor, Corporation member and Regent." A few days later he retired.

An old friend of Oscar Werwath, Mr. Schmidt's counsel was of great value to the founder and to Milwaukee industrialists in 1932, when the School was incorporated as a nonprofit educational institution. In the period immediately following World War II, he again rendered great service to MSOE through his efforts in acquiring surplus government equipment and materials which enabled it to meet the educational demands of returning veteran students. In April, 1951, he was named a member of the MSOE Corporation, and in February, 1952, was elected to the Board of Regents. He died in November, 1961.

Another memorialized in 1961 was Edward C. Cahill, alumnus and lifelong friend of MSOE who built a distinguished career at RCA Service Co., in Camden, New Jersey. He was elected first president of the firm in 1943, and in 1947 received the Radio Corporation of America's highest award to salaried employees – the RCA Victor Award of Merit.. Frank M. Folsom, chairman of the Corporation's Executive Committee, wrote:

"In all my experience in sales and merchandising, I have never witnessed such a wonderful achievement as that accomplished by you and your people in providing competent and quality service. Indeed, you and your organization were responsible to a large degree for bringing television from 'around the corner' into the homes of millions."

A 1928 graduate BS EE, Mr. Cahill served on the MSOE Board of Regents from 1952 through 1959, and as a member of the Corporation from 1952 until his death in 1961. For three years, he was also a member of the Industrial Advisory Committee on engineering electronics. He received the Honorary Degree of Electrical Engineer in 1953.

In 1961, Milwaukee School of Engineering announced the establishment of the MSOE Rudolph J. Sundstrom Memorial Loan Fund in honor of the late Director of Relations with Industry. Mr. Sundstrom had served in the position from April, 1953, until his death in the spring of 1961. Prior to 1953, he had been an instructor in the electrical engineering department.

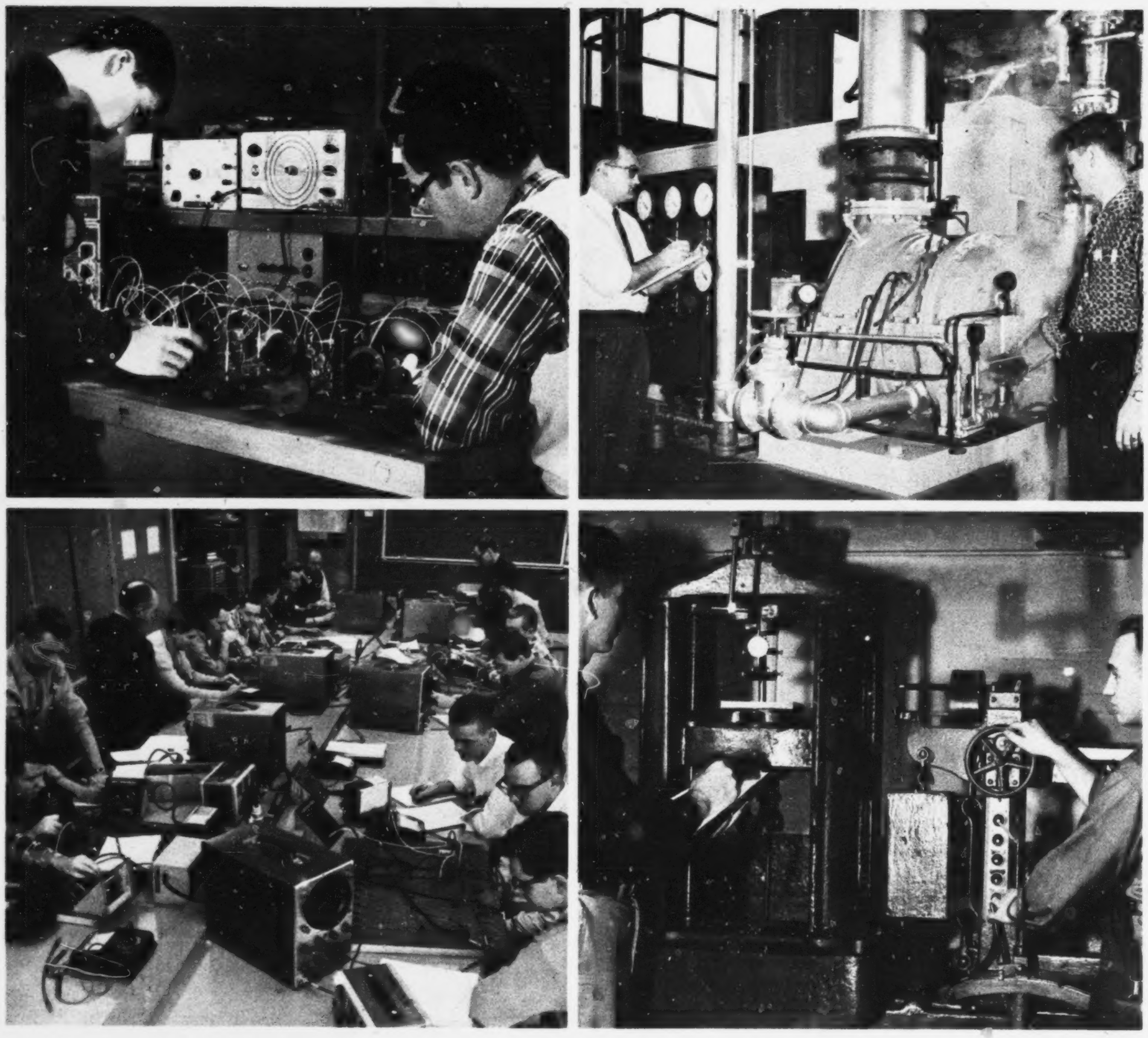
Also in 1961, Mrs. Greta W. Murphy, Director of Public Relations and Development, was elected governor of District VI of Zonta International, Inc., composed of 37 clubs in three states with some 1,400 members. Mrs. Murphy is a past president of the Zonta Club of Milwaukee, and a director of Zonta Manor, Inc. She has also served as Great Lakes District director and as a national director of the American College Public Relations Association, past president of the Wisconsin Chapter and national director of the Public Relations Society of America, and past president of the Women's Advertising Club. In September, 1960, she received a special citation from the Public Relations Society of America for her guidance in the formation and continuing development of the Wisconsin Chapter.

MSOE President Karl O. Werwath was named president of the Wisconsin Society of Professional Engineers in 1961; he had been first vice-president in 1960, and president of the Society's Milwaukee Section in 1956-'57. In June, 1962, Mr. Werwath was elected a vice-president of the American Society for Engineering Education, and was named chairman of its new technical institute council.

Curriculum revisions at MSOE were introduced in January, 1962, to provide a solid pattern for the progress of each individual student in accordance with his capacities and his occupational goal. The curriculum structure was designed to prepare engineering technicians and engineers for the space-age needs of industry and government.

All 2-year technical institute and 4-year college of engineering programs were based on a common first year of study. Integrated with technical subjects were the basic college courses in the sciences, humanities and mathematics, forming a balanced program of higher education. The curriculum readily accommodated students transferring to the School with advanced credit from other institutions, at the same time meeting the needs of students entering MSOE as freshmen.

The Bachelor of Science degree programs in electrical and mechanical engineering shared a common second year of study.



Scenes from MSOE electrical and mechanical laboratories.

The Fall Quarter 1962 offered nine programs leading to the Associate in Applied Science degree: computer engineering technology, electronic communications engineering technology, electrical power engineering technology, air conditioning engineering technology, metallurgical engineering technology, chemical production engineering technology, fluid power engineering technology, internal combustion engines engineering technology, and industrial engineering technology.

On July 1, 1960, MSOE launched its third development program, a three-year million dollar project extending through June, 1963, and with five objectives:

1. Expansion of academic and research facilities in Allen-Bradley Hall of Science.
2. Improvement of instruction, especially in general studies, through the installation of language laboratories and additional visual aid facilities.
3. A program to augment the annual operating budget by $100,000.
4. The expansion of the Student Loan Fund and Scholarship program.
5. Development of a dormitory.

The new speech laboratory and an ultra-modern transistorized language laboratory were installed on the third floor of the Broadway Building in the summer of 1961.

With the approach of the School's 60th anniversary year and in the perspective of plans announced by the City of Milwaukee Redevelopment Authority the Board of Regents raised the goal of the fund program to over five million dollars and extended the period one year to June 1964.

The City of Milwaukee Redevelopment Authority has designated 16 blocks in the East Side Area A or Juneautown Area for urban renewal. The designated area surrounds the School. An important factor in the master plan for rehabilitating the area is that it permits the Milwaukee School of Engineering to proceed on its long-range plans for a modern campus in Technology Park.

In April, 1961, School officials submitted to the Redevelopment Authority a formal offer to purchase land for this purpose.

The Board of Regents outlined six specific objectives for the 60th Anniversary Development Program of more than five million dollars to be realized by June, 1964:

1. Funds for the Engineering Tower. The proposed Engineering Tower, affording nearly 100,000 square feet of floor space will provide twice the area in the existing structures now housing the engineering faculty offices, classrooms and laboratories.

The Tower will accommodate the doubling of the student body which is expected within two years. Its cost is estimated at $2,500,000.

On November 20, 1962, Mr. Fred F. Loock, president of the Allen-Bradley Co. and Chairman of the MSOE Board of Regents, announced that the Allen-Bradley Company was pledging $1,250,000, half the cost of building the Tower.

2. Land necessary for immediate campus development. The sum of $175,000 is estimated as sufficient to purchase from the City of Milwaukee Redevelopment Authority such acreage as will fit into the School's master plan.

3. Funds for the Roy W. Johnson Dormitory. In November, 1960, the School received a donation of $75,000 from the Roy W. Johnson Foundation, Inc., for the purchase of a dormitory site. Dormitory housing is the School's most pressing student need.

The Roy W. Johnson Dormitory is planned as a twelve-story building in contemporary architecture to house 340 students. Funds for its construction, estimated to cost over $1,570,000, will be obtained on a self-liquidating loan basis.

4. Funds for faculty improvement. To maintain a qualified teaching staff, a school of technology must compete for personnel, not only with sister institutions, the universities, but with industry and government as well.

In recent years, MSOE has taken sound steps to attain a strong competitive position. Salaries across the board have generally been doubled since 1954, social security contributions tripled, a retirement plan and group insurance plan have been instituted, and a fund established to assist younger faculty members to work for higher degrees.

These increases and benefits have enlarged the annual budget by more than a quarter of a million dollars, all of which cannot be absorbed from current income sources.

5. Funds for endowment purposes. Like all non-tax-supported institutions of higher learning, MSOE gives more education than the student pays for through tuition. MSOE needs additional endowment to keep pace with over-all operating expenses. Besides gifts earmarked for this purpose, it is proposed that proceeds from the sale of the two properties now used for engineering laboratories be kept intact and invested as a permanent endowment. Their appraised value is approximately $600,000.

6. Funds for launching Operation: IMPETUS. The new educational project inaugurated by MSOE, "***I***ndustry and ***M***anagement's ***P***rogram for ***E***ngineering and ***T***echnology in the ***U***nited ***S***tates," has been designated *Operation: IMPETUS* by combining the initial letters of the key words.

It is a planned program to assist private enterprises in the development of engineers and engineering technicians from among individuals already in their employ. It is both a new form of relationship with industry and an answer to technical manpower shortages certain to increase in severity in the years ahead.

To staff, equip and promote *Operation: IMPETUS* until it becomes self-supporting, the sum of $75,000 will be allocated from the 60th Anniversary Development Program.

Mr. Harold E. Koch, former president of Hevi-Duty Electric Co., was named director of *Operation: IMPETUS* in November, 1962, and director of the School's Relations with Industry Division. Industry's response to the *Operation: IMPETUS* program has been favorable.

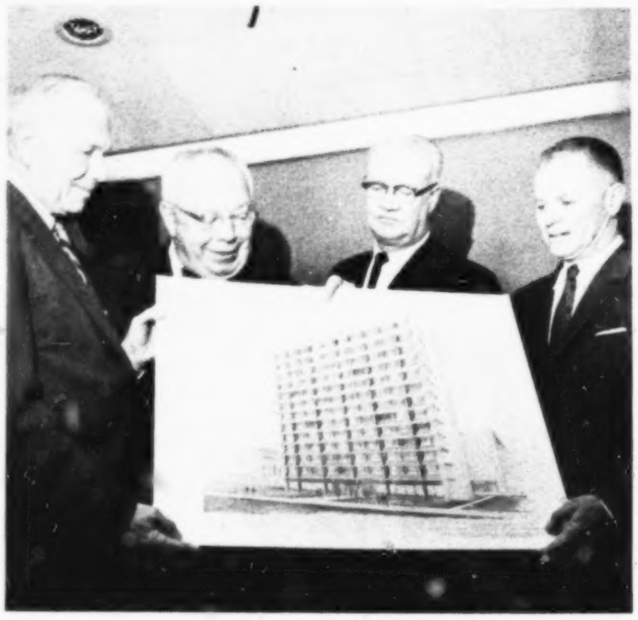
Looking still further ahead, the Board of Regents have outlined a long-range program (1964-1968) for the future development of MSOE. The program envisions a second dormitory, a student center and dining hall, a library, an auditorium, and substantial endowments to underwrite further improvement and continuous updating of its educational programs, faculty and physical plant.

The Milwaukee School of Engineering "is on the threshold of a new era of service to the industrial life of our city, our state and the nation," President Werwath stated at the 60th anniversary dinner meeting of the Board of Regents and Corporation members on January 15, 1963.

He also announced that the 60th anniversary fund program had reached 53% of its $500,000 goal, that part of the five million dollar fund drive being sought through public subscription. In October, 90% of the goal had been realized and President Werwath predicted its ultimate success by June, 1964, as a certainty.

At the 60th anniversary meeting of the Corporation, three members received citations for distinguished service to the institution:

Matthias J. Maiers, BS EE '20, Prof. EE '38, manager, Sales Service Department, Commonwealth Edison Company, Chicago, now retired and residing in Western Springs, Illinois, "for his diligent and persevering devotion to this institution through the years as a distinguished alumnus, Regent, member of the Corporation, and close associate;"



IN MILWAUKEE

John H. Murphy, "for the depth and breadth of his meticulous and scholarly services to this institution through long association as Regent, member of the Corporation, and trusted counselor;"

V. Robins Tate, BS EE '27, Hon. EE '60, "for his abundant and faithful assistance to this institution through long standing contributions as a loyal alumnus, Regent, member of the Corporation, and discerning advisor."

Through the years, MSOE has paid tribute to the individuals among alumni, faculty and staff, board of regents and corporation, industrial advisors and friends for outstanding work and contributions to its development.

At the 50th anniversary Founder's Day dinner held in 1953, thirty-five men were memorialized. Among those not previously mentioned in this resume were Welz E. Boren, secretary of the faculty from 1933 to 1937 and chairman of the Executive Educational Council from 1938 to 1946; faculty members George B. Havorson and Charles W. Simpson; industrial advisors Wheeler Bloodgood, Clar-

(left above) The Roy W. Johnson Dormitory is an essential project in the current MSOE Development Program. It is planned as a twelve-story building in contemporary architecture to house 340 students. The Dormitory, to be built in Technology Park, was so named in November, 1962, following the gift of Roy W. and Viola A. Johnson of $75,000 for the purchase of a suitable site. Total cost of the Dormitory is estimated at $1,570,000. Mr. Johnson is chairman of the board, Controls Company of America, and is a member of the MSOE Board of Regents. He is shown above (left) inspecting a sketch of the proposed Dormitory with Regents' Chairman Fred F. Loock, and Regents Harry G. Hoffman and Harold F. Falk.

(above, left to right) Chairman Loock, Regents Johnson and Hoffman, Honorary Board of Regents Chairman Walter Harnischfeger, and Regent Falk hold a rendering of the MSOE Engineering Tower, another project of the current development program. The Tower, a ten-story landmark, has been estimated to cost $2,500,000, half of which has been pledged by the Allen-Bradley Company through its president, Mr. Loock. With nearly 100,000 square feet of floor space, the Tower will provide twice as much area as the structures now housing MSOE engineering laboratories. Each of the School's technological specialties will have its own floor; rooms will be wedge-shaped, ideal for teachers and students, with maximum outdoor light from the rear. The Tower also will house academic, administrative, and business offices, with elevators, stairways, and mechanical services centered around the core.

Harold E. Koch, MSOE Director of Relations with Industry, heads the *Operation: IMPETUS* program.

ence R. Falk, Gen. Otto Falk, Albert Friedmann, A. H. Luedecke, Otto M. Rau, H. O. Seymour, Frederick L. Sivyer, Emil Vilter, Edwin Wetzel and Ignaz Wetzel.

Honored as "living co-architects of a dynamic institution" were William D. Kyle, Sr., John S. Owen II, Michael Ert, Hugo Rhode, Paul W. Hammersmith, John D. Wanvig, Jr., A. L. Pond, Gould W. Van Derzee, I. L. Illing, Rudolph Hokanson and George G. Post.

Alumnus Grover E. Kruecke, the first student to enroll at the School of Engineering back in 1903, received a 50-year service pin at the 1953 golden anniversary alumni dinner in October.

Among those whose memory was honored in the past ten years were J. Rex Vernon, General Secretary of the Industrial Advisory Committee, in 1954; Ernst Baars, faculty, also in 1954; William F. Eichfeld and Edwin W. Seeger, who served as Chairmen of the Board of Regents, both deceased in 1955.

At the 1957 Founder's Day dinner, a citation was awarded to Klaus L. Hansen for a quarter century of distinguished service as Regent, Corporation member, and industrial advisor. Robert D. Teece, executive engineer, Harnischfeger Corporation, succeeded him as General Chairman of the Industrial Advisory Committee.

Another veteran of 25 years' service to the School in various capacities was Carl J. Fechheimer, deceased October 13, 1961. He had been chairman of the committee on advanced degrees and certificates since 1944.

The passing of Alumnus Joseph A. Havlick, BS EE '21, was noted in March, 1962. A charter member, past board chairman, past president and past treasurer of the MSOE Alumni Association, Havlick had also served as an alumni counselor, editor of the alumni bulletin, and was a founder and past president of both the MSOE Alumni Endowment Association and the MSOE Athletic Association.

The merger of the three alumni groups of the School was effected in 1954 and 1958. The establishmen of one alumni organization for all former students was in conformity with the national pattern at nearly all colleges and universities. The executive committees of the three MSOE groups felt that the merger would result in more and better service for members, and eliminate duplication of effort.

In 1954, the Engineers' Alumni Association, composed of graduates of the College of Engineering, voted to dissolve the organization and to transfer all memberships, funds, documents and archives to the MSOE Alumni Association, composed of all former students of the School.

The Associated Alumni Endowment Foundation, founded in 1936, for the purpose of perpetuating MSOE through trust funds and properties benefiting the School, on February 17, 1958, voted to transfer all assets to the MSOE Endowment Fund established in 1956 to represent alumni participation in the School's Development programs.

A major event programed for the 60th anniversary year was the Founder's Day Conference held Friday, May 3, 1963, on "Trends in the Role of Engineers and Engineering Technicians in Industrial Management."

This picture of the Werwath family was taken on the occasion of the School's 60th Anniversary dinner, January 15, 1963. Seated (right) is Mrs. Hannah S. Werwath, widow of the founder; and Mrs. Hannah W. Swart, member of the MSOE Corporation. Standing are (left to right) Heinz M. Werwath, Vice-president and Treasurer; Mrs. Greta W. Murphy, Director of Public Relations and Development; and President Karl O. Werwath.

Keynote address at the 60th Anniversary Convocation on Engineers and Engineering Technicians in Industrial Management, May 3, 1963, was given by Dr. Gordon Stanley Brown, Dean of Engineering, Massachusetts Institute of Technology. The Convocation was conducted under the General Chairmanship of Emeritus Dean Fred J. Van Zeeland.

Some 400 delegates attended the Conference which was sponsored by the Milwaukee School of Engineering under the auspices of the Executive Office of The President of the United States, Office of Emergency Planning. Cosponsors were the Engineers' Society of Milwaukee, the Wisconsin Society of Professional Engineers, and the Milwaukee Chapter of the Society for Advancement of Management.

Chairing the morning session held in Memorial Hall of the Milwaukee County War Memorial Center was James C. White, Supervisor, Administrative Control, AC Spark Plug Division, General Motors Corporation. Carl R. Holdampf, President of the Engineers' Society of Milwaukee, welcomed the delegates who heard Dr. Maurice R. Graney, Dean, School of Engineering, University of Dayton at Dayton, Ohio; John Gammell, Coordinator of Professional Placement, Allis-Chalmers Manufacturing Company; and MSOE President Karl O. Werwath explore the developments in education and industry relative to the conference theme.

Keynote address of the day was delivered by Dr. Gordon Stanley Brown, Dean, School of Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts, following the noon luncheon at the Elks Club.

Dwight A. Francis, vice-president, Milwaukee Chapter, Society for Advancement of Management, chaired the afternoon session in which problems of developing management in both small and large industries were explored by Erhardt C. Koerper, president, Koerper Engineering Associates, Inc., and Jennings N. Stanbery, vice-president, personnel, Illinois Bell Telephone Company. Summarizing discussions at the Conference's close was Dr. William G. Torpey, Manpower Specialist, Executive Office of The President of the United States, Office of Emergency Planning.

Highlight of the noon luncheon was the presentation of service awards to sixty members of the faculty and administrative staff. Heading the list of those honored was Mrs. Hannah S. Werwath, widow of the School's founder. Well-known and remembered by many of the alumni, particularly among the older groups, for her warm friendliness and personal interest in their welfare while at MSOE, Mrs. Werwath has, through over half a century, marked the institution with the priceless stamp of her influence and devotion. Since the death of her

The MSOE Computation Center, located in the Allen-Bradley Hall of Science, acquired an IBM 1620 computer in October, 1963. Working on the unit in this photo are William J. Nyback (foreground), Director of Data Processing, and Prof. George A. Morrison, Director of the Computation Center. Additional equipment in the Center includes a Royal McBee General Precision LGP-30 computer, an IBM 757 printer control unit, an IBM 727 magnetic tape unit, and a Remington Rand 409-2R computer. In addition to educational and industrial research programs, the Computation Center accommodates students enrolled in Computer Engineering Technology. All MSOE students now take training in computer programming in their second quarter of study. *Milwaukee Journal photo.*

husband, Oscar Werwath, in 1948, she has been assistant treasurer on the administrative staff. A warm ovation was accorded her at the 60th anniversary meeting of the Board of Regents and Corporation on January 15, and again at the 60th anniversary Founder's Day conference luncheon.

Three members of the faculty were awarded presidential citations for long and meritorious service to the School: Walter H. Bieck of the Department of Engineering Graphics, Ewald L. Wiedner of the Department of Electrical Engineering, and Emeritus Dean Fred J. Van Zeeland, who have taught for 45, 40 and 35 years respectively.

Today, the Milwaukee School of Engineering is nationally recognized as a leading institution of education in engineering and engineering technology. The room used by its founder 60 years ago to explain the mysteries of electricity to a handful of ambitious workmen has been replaced by over 30 specialized laboratories and more than 30 classrooms. More than 300 subjects are offered in all divisions of the School, with a staff of 125 qualified men and women conducting the operation.

A group of 100 industrialists and authorities in varied scientific and engineering areas who comprise the Industrial Advisory Committee regularly reviews courses being taught at MSOE to insure that curricula keep abreast of scientific advancements and stay closely geared to the manpower needs of the region and the nation, as well as to to the needs of foreign countries which send students here for engineering and engineering technology education.

During its six decades of existence, the School has built a rich tradition of significant academic programs and research services synchronized with new technological discoveries, an assurance of merit to its student body and its industrial associates. Over 58,000 students have attended MSOE since its founding. More than 4,000 firms throughout the world employ its graduates.

Milwaukee School of Engineering now stands on the threshold of new horizons – in physical plant expansion, in building a new campus in Technology Park, in endowment for great teaching, in renewing its proud heritage of educational pioneering and aggressive progress through the past sixty years – to educate and train men, to serve industry, and to advance applied scientific knowledge.

APPENDIX

THE CORPORATION AND THE BOARD OF REGENTS

OFFICERS

***WALTER HARNISCHFEGER**
Honorary Chairman
Chairman of the Board
Harnischfeger Corporation
FRED F. LOOCK,** ***Chairman
President, Allen-Bradley Company
GEORGE C. BITTERS,** ***Vice-chairman
Vice-president, Ladish Co.
V. ROBINS TATE,** ***Secretary
Executive Vice-president, Perfex Corp.
KARL O. WERWATH,** ***President
Milwaukee School of Engineering
***HEINZ M. WERWATH**
Vice-president and Treasurer
Milwaukee School of Engineering

Chairman
Loock

Honorary Chairman
Harnischfeger

CORPORATION MEMBERS

MEMBERS WHOSE TERMS EXPIRE IN 1964

THEODORE W. BRUNER (A) (1957)
President, Bruner Corporation
ERHARD H. BUETTNER (1961)
President, Pfister & Vogel
Tanning Co.
WILLIAM S. BURDICK (1955)
Corporate Consulting Engineer
Harnischfeger Corporation
C. L. DOSTAL (1961)
President, Thilmany Pulp & Paper
Company, Kaukauna, Wisconsin
***HAROLD F. FALK (1955)**
President, The Falk Corporation
****K. L. HANSEN (1950)**
Regent (1950-1956)
Consulting Engineer
***WALTER HARNISCHFEGER (1932)**
Chairman of the Board
Harnischfeger Corporation
***WILLARD F. HENOCH (1960)**
President, Wenzel & Henoch, Inc.
****JOHN HERZFELD (1932)**
Regent (1932-1959)
Mercantile Executive
***HANS U. HJERMSTAD (A) (1952)**
President, Electro-Seal Corporation
Des Plaines, Illinois
***ROY W. JOHNSON (1952)**
Chairman of the Board
Controls Company of America
***A. C. KIECKHAFER (1956)**
Director, The West Bend Company
West Bend, Wisconsin
E. C. KOERPER (1959)
President
Koerper Engineering Associates, Inc.
F. L. LARKIN (1956)
Vice-president, Wisconsin Electric
Power Co.
***FRED F. LOOCK (1954)**
President, Allen-Bradley Company
H. P. MUELLER, JR. (1954)
Milwaukee, Wisconsin
JAMES W. NELSON, JR. (1960)
General Manager, X-Ray Dept.
General Electric Company
BROOKS STEVENS (1959)
Industrial Designer
Brooks Stevens Associates
EDMOND F. WEBB (A) (1958)
President, Webb Engineering
Associates, Inc., Franklin, Michigan
ARTHUR A. WETZEL (1951)
President, Wetzel Brothers, Inc.
READ E. WIDRIG (1962)
Milwaukee, Wisconsin

MEMBERS WHOSE TERMS EXPIRE IN 1965

GEORGE J. CALLOS (1952)
President, Klau-Van Pietersom-
Dunlap, Inc.
L. STANLEY CRANDALL
(1952-1954; 1957)
Chairman, Executive Committee
Business Supplies Corporation of
America, Skytop, Pennsylvania
HENRY J. DROPP (1960)
Assistant Vice-president
Customer Relations
Milwaukee Gas Light Company
PAUL D. GAYMAN (1955)
Vice-president,
Johnson Service Company
***HARRY G. HOFFMAN (1952)**
President, Hoffman, York,
Paulson & Gerlach, Inc.
HAROLD E. KOCH (1956)
Director, Relations With Industry
Milwaukee School of Engineering
JAMES H. KUEHN (1952)
Vice-president
Wisconsin Cold Storage Co.
HARRY L. KUNZE (1954)
Assistant Treasurer, Baso Division
Penn Controls, Inc.
T. O. LIEBSCHER (1952)
Thiensville, Wisconsin
M. J. MAIERS (A) (1947)
Regent (1947-1953)
Commonwealth Edison Company
(retired), Western Springs, Illinois
RALPH A. MILLERMASTER (1959)
Vice-president for Engineering
and Development,
Cutler-Hammer, Inc.
***JOHN H. MURPHY (1947)**
Attorney, Reuter, Murphy
and Nichols
S. LLOYD NEMEYER (1959)
Milwaukee, Wisconsin
WILBERT G. PRASSE (1955)
President, The Oilgear Company
***WILLIAM C. SCOTT (1952)**
President, Outboard Marine
Corporation
JEROME H. STANEK (1958)
President, Stanek Tool Corporation
***V. ROBINS TATE (A) (1947)**
Executive Vice-president and
Secretary, Perfex Corporation
LEO W. TOBIN, JR. (1959)
Executive Assistant to Vice-president
of Manufacturing, Ford Motor
Company, Dearborn, Michigan
C. O. WANVIG, JR. (1951)
President, Globe-Union Inc.
***KARL O. WERWATH (A) (1947)**
President, Milwaukee School
of Engineering
CARL W. ZERSEN (A) (1960)
Managing Director, Chicago Lighting
Institute, Chicago, Illinois

MEMBERS WHOSE TERMS EXPIRE IN 1966

E. J. AUXER (1955)
Branch Manager, International
Business Machines Corporation
JOHN H. BATTEN (1955)
President, Twin Disc Clutch
Company, Racine, Wisconsin
***GEORGE C. BITTERS (1954)**
Vice-president, Ladish Co.
Cudahy, Wisconsin
ROBERT H. DUMKE (A) (1963)
Vice-president, Production Manager
The Journal Company
JOHN L. GORDON (A) (1957)
Vice-president, Central Illinois
Electric and Gas Company
Rockford, Illinois
JOSEPH F. HEIL (1932-1948; 1952)
President, The Heil Co.
W. O. HELWIG (1960)
Secretary, Helwig Carbon
Products, Inc.
FRED A. LOEBEL (1957)
President, Aqua-Chem, Inc.
Waukesha, Wisconsin
GRETA W. MURPHY (1949)
Director of Public Relations
and Development, Milwaukee
School of Engineering
CHARLES A. NAGEL (1957)
President, Charles Nagel
& Associates, Inc.
HENRY W. OSBORNE (A) (1959)
Traffic Advisor, Board of Safety
City of Buffalo, New York
A. L. OSMUNDSEN (1955)
A. L. Osmundsen & Associates
JULIUS A. RIEDL (A) (1963)
Assistant Manager of Manufacturing
Milwaukee Body Plant
American Motors Corp.
HOWARD L. ROAT (1963)
Works Manager, AC Spark Plug
Division, General Motors Corp.
†*EDWARD J. ROGERS (A) (1957)
President, Layne-Northwest Company
H. JAMES SCEALES (1957)
Vice-president, First Wisconsin
National Bank of Milwaukee
HANNAH W. SWART (1949)
Fort Atkinson, Wisconsin
ALBERT O. TROSTEL, III (1963)
Vice-president, Albert Trostel &
Sons Company
JOSEPH E. UIHLEIN, JR. (1963)
President, Tamarack Petroleum
Co., Inc.
WILLIAM M. WALLACE (1958)
Vice-president, Allis-Chalmers
Manufacturing Company
CHARLES E. WAMPLER (1955)
President, Wisconsin Telephone Co.
DELMAR D. WENSINK (1956)
President, Stolper Industries, Inc.
Menomonee Falls, Wisconsin
HANNAH S. WERWATH (1949)
Assistant Treasurer
Milwaukee School of Engineering
***HEINZ M. WERWATH (1949)**
Vice-president and Treasurer
Milwaukee School of Engineering

Year in parentheses after each name is date of election to the MSOE Corporation.
*Regent
**Honorary Regent
(A) MSOE Alumnus
†Deceased

FORMER MEMBERS OF THE MSOE CORPORATION

DUDLEY B. W. BROWN (1952-1955)
President
Milwaukee Gas Light Company

†*WILLIAM GEORGE BRUCE (1932-1949)
President
Bruce Publishing Company

PHILIP G. BRUMDER (1952-1956)
President
Blackhawk Manufacturing Co.

†*EDWARD C. CAHILL (A) (1952-1961)
President
RCA Service Company
Camden, New Jersey

†*FRED H. DORNER (1932-1933)
National Vice-president
American Society of
Mechanical Engineers

†*WALTER F. DUNLAP (1932-1938) (1947-1951)
President
Klau-Van Pietersom-Dunlap Associates

†*WILLIAM F. EICHFELD (1932-1955)
Chairman (1932-1951)
President
William Eichfeld & Sons

DR. LYMAN R. FINK (1958-1959)
General Manager
Atomic Products Division
General Electric Company

***FRANK T. FREY** (1951-1957)
Vice-chairman (1952-1955)
Vice-president
Geuder, Paeschke & Frey Co.

†*CHARLES FRIEND (1932-1943)
Attorney-at-law

A. F. GALLUN, JR. (1952-1957)
Industrialist

FRED V. GARDNER (1952-1954)
President
Fred V. Gardner & Associates

†FRANK W. GREUSEL (1952-1956)
President
Greusel Distributing Corp.

***PAUL W. HAMMERSMITH** (1932-1937)
Vice-president, General Manager
Hammersmith-Kortmeyer Company

†*T. CHALKLEY HATTON (1932-1934)
Consulting Engineer

†*HARRY L. HORNING (1932-1934)
President
Waukesha Motor Company

***I. L. ILLING** (A) (1932-1936)
Illuminating Engineer
Milwaukee Electric Railway & Light Co.

GEORGE F. KASTEN (1951-1956)
Vice-president
First Wisconsin National Bank
of Milwaukee

†ARTHUR C. KEENE (1952-1956)
Vice-president
Wausau Iron Works

†*ALVIN P. KLETZSCH (1932-1934)
President
Milwaukee Auditorium Board

CHARLES H. KLINGLER (1952-1954)
Manufacturer

†GEORGE E. LONG (1954-1956)
Chairman of the Board
Koehring Company

†*ALFRED MORAWETZ (1936-1937)
Treasurer
Shallcross Controls, Inc.

JAMES B. MORRISON (1952-1953)
President
Wisconsin Telephone Company

HAROLD P. MUELLER, SR. (1952-1953)
President
L. J. Mueller Furnace Company

†*BRUNO NORDBERG (1932-1946)
Executive Engineer
Nordberg Manufacturing Co.

BRUCE F. OLSON (1956-1959)
President
Sundstrand Machine Tool Company
Rockford, Illinois

***JOHN S. OWEN, II** (1932-1937)
Assistant Cashier
First Wisconsin National Bank
of Milwaukee

J. FRANK ROBERTS (1956-1957)
Vice-president
Director of Engineering Industries Group
Allis-Chalmers Manufacturing Co.

†*THOMAS L. ROSE (1932-1935)
Architect
Kirchoff & Rose

†*A. C. SCHMIDT (1952-1961)
Coordinator
Milwaukee School of Engineering

RUFUS K. SCHRIBER, JR. (1955-1960)
President
U.S. Motors Corporation
Oshkosh, Wisconsin

CHARLES R. SEABORNE (1955-1960)
Executive Vice-president
Thilmany Pulp & Paper Co.
Kaukauna, Wisconsin

†*E. W. SEEGER (1952-1955)
Chairman (1955)
Vice-president in Charge of Development
Cutler-Hammer, Inc.

†*ARTHUR SIMON (1932-1934)
Consulting Engineer
Cutler-Hammer, Inc.

J. H. SMITH (1952-1957)
General Manager, X-Ray Dept.
General Electric Company

W. H. STIEMKE (1957-1958)
Manager, Milwaukee Plant
Caterpillar Tractor Company

GEORGE J. SWART (1952-1956)
Fort Atkinson, Wisconsin

†A. O. TROSTEL, JR. (1961-1962)
President
Albert Trostel & Sons Co.

†*GUSTAVE J. A. TROSTEL (1932-1935)
Vice-chairman (1932-1935)
President
Albert Trostel & Sons Co.

†*J. REX VERNON (1952-1953)
Vice-president
Johnson Service Co.

†J. R. WALLACE (1960-1961)
Secretary
A. O. Smith Corporation

***J. D. WANVIG, JR.** (1932-1948)
Vice-president, General Manager
Globe-Union Manufacturing Company

***JOHN WEILAND** (1952-1956)
Works Manager, Milwaukee Body Plant
Nash-Kelvinator Corporation

†*OSCAR WERWATH (1935-1948)
President (1903-1948)

Years in parentheses after each name is period of membership in the MSOE Corporation.
Affiliation is that held at time of membership.

*Regent

(A) MSOE Alumnus

†Deceased

APPENDIX

THE INDUSTRIAL ADVISORY COMMITTEE

K. L. HANSEN
Consulting Engineer
Honorary General Chairman

ROBERT D. TEECE
Vice-president of Engineering
Harnischfeger Corporation
General Chairman

ELECTRICAL ENGINEERING

WILLIAM H. ELLIOT (1951; 1968)
Chairman
Supervising Development Engineer
Cutler-Hammer, Inc.

PAUL L. PISKEL (A) (1961; 1965)
Manager, Quality Control
Collins Radio Company
Cedar Rapids, Iowa

EDWIN T. SHERWOOD (1952; 1964)
Engineer in Charge of
Design and Development
Globe-Union Inc.

WILLIAM A. VAN ZEELAND (A) (1961; 1966)
Systems Analyst
Office of Secretary of Defense
Advanced Research Projects Agency
Washington, D. C.

COMPUTER ENGINEERING TECHNOLOGY

DOUGLAS R. LEHMAN (A) (1961; 1965)
Chairman
Senior Systems Analyst
Johnson Service Company

C. W. BRECKENRIDGE (1962; 1967)
Manager, Customer Engineering Dept.
Computer Division
Control Data Corporation
Minneapolis, Minnesota

E. CHURLIN (1962; 1967)
Manager
Central Region Product Service
General Electric Company
Chicago, Illinois

J. N. MARSHALL (1962; 1966)
Manager
Advanced Systems Development Engineering
Electronic Data Processing Division
Radio Corporation of America
Camden, New Jersey

A. JOHN SIITARI (A) (1961; 1968)
Field Customer Engineering Manager
Milwaukee Branch
International Business Machines Corp.

ELECTRICAL POWER ENGINEERING TECHNOLOGY

CARLOS L. HARRY (A) (1952; 1967)
Chairman
President
Holt Electric Motor Company

HENRY F. BEHLING (A) (1952; 1965)
Retired from the Bureau
of Electrical Services
City of Milwaukee

A. J. BUGE (A) (1961; 1966)
President
Buge Electric, Inc.

H. J. KNOLLER (1952; 1968)
Vice-president
Albert Trostel & Sons Company

WILLIAM N. LAMPIRIS (A) (1952; 1964)
Chairman of the Board
Electric Sales & Engineering Co.

ELECTRONIC COMMUNICATIONS ENGINEERING TECHNOLOGY

PHILIP B. LAESER (1957; 1964)
Chairman
Manager, AM, FM, and TV Engineering
WTMJ, WTMJ-FM, WTMJ-TV
The Milwaukee Journal Stations

JOSEPH A. BEADY (A) (1959; 1965)
Experimental Electrical Engineer (Sr.)
A. O. Smith Corporation

HAROLD A. HOGAN (A) (1961; 1966)
Chief Test Engineer
AC Spark Plug Division
General Motors Corporation

JACK H. HOTCHKISS (A) (1961; 1967)
Administrative Program Manager
Collins Radio Company
Cedar Rapids, Iowa

NORBERT J. RICHARD (A) (1949; 1968)
Engineering Supervisor
WISN-TV, Division of Hearst Corp.

Chairman Teece

Honorary Chairman Hansen

MECHANICAL ENGINEERING

IRVIN J. HAUS (A) (1945; 1968)
Chairman
Manager, Plant Engineering
Line Material Industries
McGraw-Edison Company

RUSSELL W. HENKE (1959; 1966)
Director, Fluid Power Institute
Milwaukee School of Engineering

T. B. JEFFERSON (1951; 1967)
Publisher
The Welding Engineer
Morton Grove, Illinois

EDWIN O. MARTINSON (1952; 1965)
Vice-president in Charge of
Research and Development
Koehring Company

WESLEY R. MASTER (1959; 1964)
Vice-president of Engineering
The Dynex Company
Pewaukee, Wisconsin

AIR CONDITIONING ENGINEERING TECHNOLOGY

JOHN A. LOFTE (1945; 1964)
Chairman
Chief Engineer
Lofte & Fredericksen

NORMAN J. JANISSE (1961; 1967)
Manager, Field Engineering Department
Johnson Service Company

BLAINE A. JOHNSON (A) (1948; 1967)
President
B. A. Johnson Sales Company
Chicago, Illinois

OMER M. LARSON (A) (1945; 1966)
President
Federal Store Equipment Co., Inc.

M. R. PAULSEN (1949; 1965)
Director of Graduate Training
The Trane Company
La Crosse, Wisconsin

OTTO J. RESS (1956; 1968)
Manager, Customer Services
Climatrol Division
Worthington Air Conditioning Co.

FLUID POWER ENGINEERING TECHNOLOGY (Management Board MSOE Fluid Power Institute)

WESLEY R. MASTER (1959)
Chairman
Vice-president of Engineering
The Dynex Company
Pewaukee, Wisconsin

RUSSELL W. HENKE (1959)
Director, Fluid Power Institute
Milwaukee School of Engineering

OTTO J. MAHA (1963)
Vice-president, International Division
Parker-Hannifin Corporation
Des Plaines, Illinois

JOHN C. McALVAY (1962)
Vice-president, Engineering
Webster Electric Company
Racine, Wisconsin

THEODORE PEARCE (1962)
Executive Vice-president and Secretary
National Fluid Power Association
Thiensville, Wisconsin

(A) Alumnus. First year in parenthesis after each name indicates year in which member was first named to the Committee; second year is term of membership)

APPENDIX

INDUSTRIAL ADVISORY COMMITTEE

JOHN J. PIPPINGER (1962)
Vice-president
Racine Hydraulics Development Corporation
Racine, Wisconsin

WILLIAM C. RICHARDS, JR. (1963)
Executive Vice-president
Bellows-Valvair Div. of
Intl. Basic Economy Corporation
Akron, Ohio

ERNST WIEDMANN (1959)
Vice-president, Director of Engineering
The Oilgear Company

F. BURROWS ESTY (1962; 1966)
Vice-president and Chief Engineer
Wisconsin Motors Corporation

INDUSTRIAL ENGINEERING TECHNOLOGY

ALLTON J. DANNENBERG (1961; 1967)
Chairman
Chief Industrial Engineer
Cornell Division
St. Regis Paper Company

CLARENCE ALLEN (1961; 1966)
Superintendent
Amron Corporation
Waukesha, Wisconsin

ARNOLD E. JAKEL (1961; 1964)
Control Consultant
Waukesha, Wisconsin

BURNETT M. KLUGE (1952; 1965)
Chief Engineer, Power Ventilators
Climatrol Division
Worthington Air Conditioning Co.

FRANK R. STRANG (1961; 1968)
Division Superintendent
The Louis Allis Company

INTERNAL COMBUSTION ENGINES ENGINEERING TECHNOLOGY

JAMES W. MOHR (1960; 1967)
Chairman
Assistant Research Director
Research Center
Outboard Marine Corporation

ROBERT CRAMER, JR. (1962; 1964)
Chief Engineer
Murphy Diesel Company

THOMAS B. EGAN (A) (1962; 1965)
Manager, Denver District
Construction and Mining Div.
Harnischfeger Corp.
Denver, Colorado

METALLURGICAL ENGINEERING TECHNOLOGY

FRANK M. ALLEN (A) (1952; 1967)
Chairman
Works Manager
Smith Engineering Works

HUGO E. FREE (A) (1945; 1964)
Welding Superintendent
The Oilgear Company

CHAUNCY C. HART (1945; 1968)
Manufacturing Consultant

ARTHUR W. LIBBY (1961; 1966)
Manager, Personnel Dept.
The Falk Corporation

ROBERT E. THURNER (1956; 1965)
President
Thurner Heat Treating Co.

CHEMICAL PRODUCTION ENGINEERING TECHNOLOGY

RALPH BUCHEN (1962; 1967)
Chairman
Personnel Manager
Staff Engineering Department
Kimberly-Clark Corporation
Neenah, Wisconsin

MATHEMATICS

NORMAN C. STORCK (1961; 1964)
Chairman
Chief Electrical Engineer
Wisconsin Electric Power Co.

WALLACE HUEBNER (1956; 1966)
Assistant Chief Engineer
Ladish Co.
Cudahy, Wisconsin

KARL KALSEN (1959; 1965)
Supervisor, Material Evaluation Unit
Square D Company

PHYSICAL SCIENCES

C. DAVID WILSON (1961; 1968)
Chairman
Vice-president and Assistant Tanner
Fred Rueping Leather Company
Fond du Lac, Wisconsin

JOHN B. KAHOUN (A) (1961; 1965)
Project Engineer
Consolidated Papers, Inc.
Wisconsin Rapids, Wisconsin

ALLISON K. SIMONS (1961; 1964)
Executive Vice-president
Bostrom Aktien-Gesellschaft
Zug, Switzerland

ERNEST F. VILTER (1948; 1966)
President
E. F. Vilter Company

GENERAL STUDIES

RALPH W. ELLS (1956; 1967)
Chairman
Chief Economist
Allen-Bradley Company

IRVING G. BOHRMAN (1956; 1968)
President
Perfex Corporation

E. O. ERRATH (1945; 1964)
Milwaukee, Wisconsin

JOHN GAMMELL (1951; 1964)
Director of Professional Development
Allis-Chalmers Manufacturing Co.

LEO G. KILLIAN (A) (1956; 1965)
La Mesa, California

HAL KUEHL (1962; 1966)
Vice-president
First Wisconsin National Bank of Milwaukee

DORR C. SNOYENBOS (1952; 1965)
Director of Personnel
AC Spark Plug Division
General Motors Corporation

ROBERT H. WEAVER (1956; 1966)
Director of Industrial Relations
The Falk Corporation

JOHN H. WESSEL (1961; 1968)
Attorney

INSTITUTE OF LEATHER TECHNOLOGY

ALBERT O. TROSTEL, III (1962; 1967)
Chairman
Vice-president
Albert Trostel & Sons Company

ILLUMINATION TECHNOLOGY

CARL W. ZERSEN (A) (1956; 1967)
Chairman
Managing Director
Chicago Lighting Institute
Chicago, Illinois

O. A. HILL, JR. (1956; 1968)
Marketing Supervisor, Commercial-Industrial
Commonwealth Edison Company
Chicago, Illinois

ARTHUR P. LARSON (1956; 1965)
Division Testing Engineer
Commonwealth Edison Company
Chicago, Illinois

WILLIAM L. LOWELL (1959; 1966)
District Engineer
Lamp Division
General Electric Company

JOHN H. WANSKA (1959; 1964)
Lighting Engineer
Wisconsin Electric Power Co.

(A) Alumnus. First year in parenthesis after each name indicates year in which member was first named to the Committee; second year is term of membership)

APPENDIX

EVENING DIVISION INDUSTRIAL ADVISORY COMMITTEE

JOHN B. FOLEY (1959)
General Chairman
Personnel Director
Ladish Co.
Cudahy, Wisconsin

SUPERVISORY, INDUSTRIAL MANAGEMENT, AND INDUSTRIAL RELATIONS PROGRAM

WAYNE E. BUSSE (A) (1959)
Chairman
Assistant Personnel Director
Harnischfeger Corporation

C. J. NILES (1959)
Personnel Director
Wehr Steel Company

J. D. YOCOM (1959)
Manager, Employee Relations
Hotpoint Co., Division of
General Electric Co.

INDUSTRIAL ELECTRONICS (COMPUTER OPTION) PROGRAM

ERNEST L. BEHAGEN (A) (1959)
Chairman
Sales Engineer
Radio Parts Company, Inc.

JOSEPH A. BEADY (A) (1959)
Experimental Engineer (Sr.)
A. O. Smith Corporation

ROBERT E. BOLDT (1959)
Chief Inspector
Square D Company

ROBERT L. SCHAFER (1959)
Public Relations Supervisor
Wisconsin Telephone Company

INDUSTRIAL ELECTRICAL POWER PROGRAM

FRED W. BUSH (1959)
Assistant to the Vice-president
Power Equipment Division
Allis-Chalmers Manufacturing Co.

ARTHUR H. GRAETTINGER (A) (1959)
Standards Engineer
Allen-Bradley Company

THEODORE B. JOCHEM (1959)
Technical Personnel Supervisor
Cutler-Hammer, Inc.

FLUID POWER PROGRAM (Management Board MSOE Fluid Power Institute)

See committee listed on page 70

SMALL INTERNAL COMBUSTION ENGINE PROGRAM

JAMES W. MOHR (1960)
Chairman
Assistant Research Director
Research Center
Outboard Marine Corporation

JOSEPH E. BOLAN (1960)
Secretary-Treasurer
Nu-Way Auto Electric Co., Inc.

REUBEN J. CORY (1960)
Vice-president
Wisconsin Magneto Company

GUSTAV JANSSEN, JR. (1960)
Teacher
Custer High School

DON KAUFMAN (1960)
Technical Training Director
Marketing Division
Clinton Engines Corp.
Maquoketa, Iowa

V. R. KAUFMAN (1960)
Assistant Chief Engineer
Jacobsen Manufacturing Co.
Racine, Wisconsin

E. J. REINELT (1960)
Chief Product Engineer
The West Bend Company
West Bend, Wisconsin

EDWARD SNYDER (1960)
Power Products Div.
Tecumseh Products Co.
Grafton, Wisconsin

JOSEPH J. STEPHENS (1960)
Assistant Manager
Service Dept.
Briggs & Stratton Corp.

OPERATIONS RESEARCH PROGRAM

ALLTON J. DANNENBERG (1960)
Chairman
Chief Industrial Engineer
Cornell Division
St. Regis Paper Company

GEORGE R. EICHELBERGER (1960)
Business Research Dept.
Jos. Schlitz Brewing Co.

DOUGLAS R. LEHMAN (A) (1960)
Senior Systems Analyst
Johnson Service Company

FRANK R. STRANG (1960)
Division Superintendent
The Louis Allis Company

METALLURGY PROGRAM

JOHN B. FOLEY (1959)
Chairman
Personnel Director
Ladish Co.
Cudahy, Wisconsin

ROBERT E. MAERSCH (1959)
Chief Development Metallurgist
Ampco Metal, Inc.

GRAPHIC ARTS INSTITUTE

DAVID W. JONES (1957)
Chairman
Executive Director
Graphic Arts Association
of Wisconsin

BURTON E. HOTVEDT (1953)
Vice-president
The Brady Company

CHARLES W. SCHUMACHER (1959)
Secretary
Hammersmith-Kortmeyer Co.

VICTOR F. R. SCHWARZE (1953)
Vice-president, General Manager
The Krus Company

ARTHUR M. SNAPPER (1953)
Chairman of the Board
Milprint, Inc.

EDWARD C. WELKE (1959)
Foreman, Plate Department
E. F. Schmidt Company

DOUGLAS WILLIAMS (1959)
Sales Manager
W. A. Krueger Company

(A) Alumnus. Year in parentheses after each name indicates year in which member was named to the Committee.

FORMER MEMBERS OF THE INDUSTRIAL ADVISORY COMMITTEE

JOSEPH R. AKERMAN (1947)
Director
Refrigeration, Heating and
Air Conditioning Institute
Milwaukee School of Engineering

ROBERT APPLE (1953)
Secretary-Treasurer
Trade Press Publishing Co.

E. J. AUXER (1952-1955)
Branch Manager
International Business Machines Corp.

WILLIAM H. BADKE (1953-1958)
William H. Badke Advertising Agency

E. A. BEHLING (1934-1948)
Superintendent, Welding Shop
Vilter Manufacturing Co.

A. J. BENNER (1947-1951)
Assistant Sales Manager
Allen-Bradley Company

FRANK S. BEST (A) (1951-1961)
Director of Engineering
Cordley & Hays
New York, New York

R. A. BOECK (1934-1948)
Welding Engineer
Worden-Allen Company

E. C. BREKELBAUM (A) (1945-1952)
Vice-president of Engineering
Harnischfeger Corporation

CHARLES H. BURKHARDT (1951-1961)
National Secretary
Oil Heat Institute of America, Inc.
New York, New York

ROBERT H. BURKS (1949-1958)
General Superintendent
Cooper Alloy Corp.
Clark Township, New Jersey

E. C. CAHILL (A) (1952-1953)
President
RCA Service Company
Camden, New Jersey

A. J. CASSER (1959-1961)
Representative
Oil Hydraulics Division
Webster Electric Company
Racine, Wisconsin

J. R. CHAMBERS (1957-1958)
Manager, Sales Promotion
Benjamin Electric Manufacturing Co.
Des Plaines, Illinois

MARTIN J. CLANCY (1949-1951)
Managing Director
Solid Fuel Institute

I. H. COHLER (1951-1953)
I. H. Cohler Company
Chicago, Illinois

R. R. DAVISSON (1962)
Manager, Training Field Engineering Group
Computer Department
General Electric Company
Phoenix, Arizona

JUSTIN A. DEUBEL (1949-1961)
Chief Engineer
Research and Development Center
General Controls Company

P. O. DOMKE (1949-1953)
Sales Manager
Mueller Brass Company
Port Huron, Michigan

DONALD R. DOWNING (A) (1945-1948)
Partner
Weldments Company

HENRY J. DROPP (1945-1961)
Director, Customer Relations and Service
Milwaukee Gas Light Company

RALPH H. EDER (1952-1953)
President
Television Service Engineers Co.

P. W. EELLS (1952-1961)
Vice-president
Le Roi Company

LOUIS S. EHRICH JR. (1951-1961)
Manager, Service Department
Webster Electric Company
Racine, Wisconsin

RENE V. ELICANO (1961-1962)
Operations Research Engineer
Allis-Chalmers Manufacturing Co.

HAROLD F. FALK (1952-1955)
Vice-president
The Falk Corporation

C. J. FECHHEIMER (1947-1962)
Consulting Engineer

DANIEL W. GELLERUP (A) (1952-1961)
Engineering Consultant
Whitefish Bay

A. F. GILLIARD (1957-1958)
Division Engineering Manager
Cherry-Burrell Corporation

HAROLD D. GRAY (1949-1953)
Branch Manager
Penn Electric Switch Co.

OTTO GREY (1934-1939)
Superintendent, Construction Div.
Chain Belt Company

F. A. GROSSMAN (1951)
Air Conditioning Manager
Servel, Inc.
Chicago, Illinois

STUART HAAGENSEN (1949-1950)
Employment Manager
Allis-Chalmers Manufacturing Co.

RICHARD M. HALL (1959-1961)
Engineering Sales Representative
Wheeler Reflector Company
Maywood, Illinois

JOSEPH F. HEGERICH (1959-1962)
Deerfield, Illinois

WALTER E. HENNING (A) (1952-1953)
President
Electric Sales & Engineering Co.

GEORGE E. HOCHSTEIN (1957-1961)
Vice-president
Heil-Quaker Corporation
Nashville, Tennessee

WALTER F. HUETTE (A) (1959-1961)
Project Engineer
Allen-Bradley Company

THOMAS HUGHEY (1949-1953)
District Manager
Westerlin & Campbell Company

JOSEPH F. HUSHEK (A) (1952-1953)
Secretary-Treasurer
Wesley Steel Treating Co.

I. L. ILLING (A) 1957-1961)
Lighting Consultant
Manufacturers' Representative

LESLIE INNIS (1959-1961)
Manager, Equipment Manufacturing Sales
Sylvania Electric Products, Inc.
Salem, Massachusetts

DR. JOHN E. JACOBS (1957-1961)
Manager, Advanced Development Lab.
X-Ray Department
General Electric Company

CARL F. JENSEN (1957-1958)
Regional Illuminating Engineer
Westinghouse Electric Corporation
Chicago, Illinois

GUSTAV JOHNSON (1934-1950)
Service Supervisor
Air Reducation Sales Company

J. C. JOUBLANC (1934)
Chief Metallurgist
Harnischfeger Corporation

MILTON S. KIVER (1949-1951)
Author
Chicago, Illinois

RICHARD G. KOCH (1949-1953)
House Heating Engineer
Milwaukee Gas Light Company

E. C. KOERPER (1952-1958)
President
Koerper Engineering Associates, Inc.

(A) Alumnus. Years in parentheses after each name is period of membership. Affiliation is that held at time of membership.

FRANK M. KULKA (1959-1961)
General Superintendent
Motor Castings Company

HAROLD LOEFFLER (1949-1950)
Commuting Engineer
Wisconsin Telephone Company

RALPH R. LUSK (1957-1961)
Lighting Engineer
Commonwealth Edison Company
Chicago, Illinois

RAYMOND F. LUTZ (1952-1961)
Service Manager
Admiral Distributors, Milwaukee
Division of Admiral Corporation

GERALD MARKS (1959-1961)
Partner, Lighting Associates
Chicago, Illinois

EARL MAY (1949-1950)
Mechanical Engineer
Wisconsin Electric Power Co.

GEORGE H. McKENZIE (1952-1953)
Supervisor
Material Handling Dept.
Ladish Co.
Cudahy, Wisconsin

E. F. MEKELBURG (1947-1961)
Special Purpose Control
Managing Engineer
Square D Company

JAMES J. MELLON (1952-1958)
Chief Engineer
Allen-Bradley Company

THOMAS MELVILLE (1947-1948)
Head, Refrigeration Department
Milwaukee School of Engineering

J. M. MITHUS (1949-1950)
Webster Electric Company
Racine, Wisconsin

J. V. MONAGHAN (1949-1950)
District Manager
Servel, Inc.

DR. S. H. MORTENSEN (1947-1958)
Chief Electrical Engineer
Allis-Chalmers Manufacturing Co.

WILLIAM O. MOSHER (1962)
Manager, Customer Service Planning
Royal McBee Corporation
Port Chester, New York

RICHARD NEBEL (1959-1961)
Sales Representative
J. D. Wilson Company

ARNOLD H. NIELSEN (1952-1961)
Director of Training
Wisconsin Electric Power Co.

JAMES ORNAHEIM (1947-1948)
Employment Manager
Allis-Chalmers Manufacturing Co.

L. E. OSWALD (1953-1958)
Treasurer
E. F. Schmidt Company

RALPH J. OWEN (A) (1947-1961)
Chief Application Engineer
The Louis Allis Company

GLENN E. PARKER (1953-1958)
Vice-president
The Heinn Company

LAWRENCE E. PETERSON (A) (1953)
Consulting Engineer

PAUL REED (1947)
Head, Refrigeration and
Air Conditioning Division
Perfex Corporation

TIMOTHY A. SCHAEFER (A) (1949-1961)
Tool Consultant
West Allis, Wisconsin

REGINALD G. SCHULER (1957-1958)
Director of Engineering
Badger Meter Manufacturing Co.

MARVIN G. SEDAM (1939)
Chief Metallurgist
Harnischfeger Corporation

E. W. SEEGER (1947-1951)
Vice-president in Charge of Development
Cutler-Hammer, Inc.

DR. ARTHUR SIMON (1945-1948)
Consulting Engineer

JEROME H. STANEK (1948-1958)
Vice-president
Stanek Tool Corporation

R. W. STERNKE (1934-1948)
Shop Superintendent
Lakeside Bridge & Steel Co.

GEORGE J. SWART (A) (1945-1951)
Director of Central Purchasing
Milwaukee School of Engineering

E. SZEKELY (1947-1948)
President
Bayley Blower Company

JOHN P. TANSEY (1957-1961)
National Service Manager
Communications and Electronics Div.
Motorola, Inc.
Chicago, Illinois

V. ROBINS TATE (A) (1945-1951)
Executive Vice-president and Secretary
Perfex Corporation

GEORGE O. TOEPFER (1947-1961)
President and Treasurer
The Maag Company

J. M. TOWNSEND (1952-1953)
Air Conditioning Manager, Midwest Area
Servel, Inc.
Chicago, Illinois

J. REX VERNON (1945-1954)
Vice-president
Johnson Service Company
General Secretary
Industrial Advisory Committee 1952-1954

FRED J. VAN ZEELAND (A) 1947-1951)
Director, Institute of Electrotechnics
and College of Engineering
Milwaukee School of Engineering

JEROME B. WELCH (1945-1961)
Process and Manufacturing Engineer
Cutler-Hammer, Inc.

WILLIAM J. WEEKS (1949-1951)
Head, Department of Welding
Milwaukee School of Engineering

ARTHUR A. WETZEL (1953)
President
Wetzel Brothers, Inc.

DAVID P. WOOD (1957-1958)
Manager, Sales Promotion
Commonwealth Edison Company
Chicago, Illinois

RAYMOND E. WOZNIAK (1959-1961)
Engineer, Lecturer, Demonstrator
Chicago Lighting Institute
Chicago, Illinois

PIONEER ADVISORS SCHOOL OF ENGINEERING OF MILWAUKEE, 1913-1930

H. P. ANDRAE (1915)
Secretary
Julius Andrae Sons & Co.

JOHN D. BALL (1917)
Member AIEE, Professor
School of Engineering

GEORGE J. BALZER (1913)
Principal
Washington High School

WILLIAM BAUM (1917)
Member AIEE, Dean
School of Engineering

E. C. BAYERLEIN (1918)
Vice-president
Nordberg Manufacturing Co.

REV. C. B. BEALE (1918)
Pastor, Grand Avenue
Congregational Church

THOMAS BERRY (1913)
District Plant Chief
Wisconsin Telephone Company

JOHN BLACKIE (1918)
Superintendent
Wisconsin Coke & Gas Co.

(A) Alumnus. Years in parentheses after each name is period of membership. Affiliation is that held at time of membership.

WHEELER P. BLOODGOOD (1918)
Attorney
Bloodgood, Kemper & Bloodgood

H. W. BOLENS (1915)
President, Gilson Mfg. Co.
Port Washington, Wisconsin

S. F. BRIGGS (1918)
President
Briggs & Stratton Co.

R. B. BROWN (1918)
General Manager
Milwaukee Gas Light Co.

WILLIAM GEORGE BRUCE (1914)
Secretary
Merchants and Manufacturers
Association

R. F. COERPER (1918)
President and General Manager
Western Motor Car Supply Co.

H. CULVER (1918)
Manager
Plankinton Packing Co.

F. H. DORNER (1918)
Secretary
Engineering Society of Milwaukee

WILLIAM F. EICHFELD (1929)
President
William Eichfeld & Sons

F. W. ELLS (1918)
Secretary and Chief Engineer
Northwestern Manufacturing Co.

MICHAEL ERT (1926)
President
Michael Ert, Inc.

CLARENCE R. FALK (1929)
Secretary
The Falk Corporation

A. H. G. FOKKER (1926)
President
Atlantic Aircraft Corp.

A. FRIEDMANN (1918)
President
Edward Schuster & Company

CHARLES FRIEND (1929)
Attorney; President
Bonded Attorneys Assoc.

M. H. GROSSMAN (1918)
General Manager
Investment Securities

THOMAS P. HAMILTON (1926)
President
Hamilton Aero Mfg. Co.

HENRY HARNISCHFEGER (1929)
President
Harnischfeger Corporation

WALTER HARNISCHFEGER (1930)
President
Harnischfeger Corporation

A. G. HENDRICKS (1918)
Vice-president
Pawling & Harnischfeger

CARL HERZFELD (1929)
General Manager
Boston Store

DANIEL W. HOAN (1925)
Mayor
City of Milwaukee

JOHN A. HOEVELER (1918)
Illuminating Engineer
Wisconsin Industrial Commission

RUDOLPH HOKANSON (1926)
General Manager
Nash Sales Co.

HARRY L. HORNING (1930)
President
Waukesha Motor Co.
Waukesha, Wisconsin

J. C. JOCELYN (1918)
Executive
F. Mayer Boot & Shoe Co.

LESLIE KILLAM (1913)
Plant Chief
Wisconsin Telephone Company

ALVIN P. KLETZSCH (1916)
President
Republican House

W. D. KYLE (1918)
General Manager and Treasurer
Line Material Co.

A. LANDAUER (1923)
President
Landauer & Son

P. L. LEE (1918)
Manager
Postal Telegraph Co., Milwaukee

DR. CHARLES S. LEVI (1918)
Rabbi
Temple B'ne Jeshurum

L. B. MARKS (1918)
Treasurer
Illuminating Engineering Society
New York, New York

HANS J. MEYER (1916)
Consulting Engineer

FRED A. MOHR (1918)
Manager, Western Union
Telegraph Co., Milwaukee

F. C. MOREHOUSE (1918)
President
The Morehouse Publishing Co.

W. F. MYERS (1925)
President
Merchants & Manufacturers Bank

B. V. E. NORDBERG (1926)
Executive Engineer
Nordberg Manufacturing Co.

C. E. PATTERSON (1918)
Comptroller
General Electric Co.
Schenectady, New York

W. R. PATTON (1915)
Milwaukee Manager
Wagner Electric Co.

A. L. POND (1915)
Manager, Milwaukee Office
General Electric Co.

G. G. POST (1918)
Electrical Engineer
The Milwaukee Electric
Railway & Light Co.

JOHN PUTNAM (1918)
Director, Citizens Bureau
of Municipal Efficiency
Milwaukee

O. M. RAU (1914)
General Manager
Commonwealth Power Co.

THOMAS L. ROSE (1930)
Architect
Kirchoff & Rose

H. O. SEYMOUR (1918)
General Manager
Wisconsin Telephone Company

CARROLL H. SHAW (1915)
Electrical Engineer
Sheboygan Railway & Electric Co.

ARTHUR SIMON (1916)
Fellow, American Institute
of Electrical Engineers

F. L. SIVYER (1918)
President
Northwestern Malleable Iron Co.

CHARLES P. STEINMETZ (1918)
Chief Consulting Engineer
General Electric Co.

H. M. STEUSSY (1929)
Vice-president
Kesselman O'Driscoll Co.

DR. E. R. STOEKLY (1918)
Physicist
Cutler-Hammer Manufacturing Co.

JOHN B. TANNER (1918)
President
Tanner-Gilman Schools, Inc.
Chicago, Illinois

Year in parentheses after each name indicates initial appointment to the original Advisory Board (1913-1917) or to the Advisory Council (1918-1930). Affiliation is that held at time of membership.

GUSTAVE J. A. TROSTEL (1929)
President
Albert Trostel & Sons Co.

G. W. VAN DERZEE (1916)
Assistant to Vice-president
The Milwaukee Electric
Railway & Light Co.

FRANCIS A. VAUGHN (1916)
Fellow, American Institute
of Electrical Engineers

EMIL VILTER (1918)
Shop Superintendent
Vilter Manufacturing Co.

JOHN C. WANVIG (1930)
Vice-president, General Manager
Globe-Union Mfg. Co.

S. B. WAY (1917)
Vice-president, General Manager
The Milwaukee Electric
Railway & Light Co.

ED WETZEL (1930)
Attorney-at-Law

W. M. WHITE (1918)
Manager, Chief Engineer
Hydraulic Dept.
Allis-Chalmers Manufacturing Co.

BURT WILLIAMS (1929)
Official Tax Consultant
Wisconsin Bankers' Association

DEGREE OF PROFESSIONAL ELECTRICAL ENGINEER

CONRAD A. BAUER
BS EEp '24, Prof EE '41
Retired
Commonwealth Edison Company
Sumner, Illinois

LE ROY F. DEMING
BS EEp '22, Prof EE '43
Manager, Power Generation Branch
U. S. Government, Dept. of Navy
Bureau of Yards and Docks
Arlington, Virginia

VIRGIL M. DUFECK
BS EEp '37, Prof EE '44
Manager
Eau Claire Electric Cooperative
Eau Claire, Wisconsin

†JOSEPH A. HAVLICK
BS EEp '21, Prof EE '52
Supervisor of Rates and Rules
Wisconsin Electric Power Co.
Shorewood, Wisconsin

MATTHIAS J. MAIERS
BS EEp '20, Prof EE '38
Retired
Commonwealth Edison Company
Western Springs, Illinois

SIDNEY A. MOORE
BS EEp '24, Prof EE '43
Operating Engineer
Arizona Power Authority
Phoenix, Arizona

DEGREE OF HONORARY ELECTRICAL ENGINEER

RAFAEL ACUNA E.
CEE '26, Hon EE '47
Head, PBX Dept.
Ericcson Telephone Enterprise
Lomas de Chapultepec
Mexico 10, D. F.

ARTHUR J. ALLEN
CEE '30, Hon EE '46
Regional Manager
The Louis Allis Company
Glenview, Illinois

WALTER O. BAER
Elect '17, Hon EE '46
Retired
Cutler-Hammer, Inc.
Hales Corners, Wisconsin

†AARON C. BOCHER
EE '13 Hon EE '46
Herman Andrae Electrical Co.
Shorewood, Wisconsin

ERWIN C. BREKELBAUM
Hon EE '42
Vice-president
Thew Shovel Company
Elyria, Ohio

†EDWARD C. CAHILL
BS EEp '28, Hon EE '53
RCA Service Company
Haddonfield, New Jersey

†CHARLES L. CHAFEE
EE '17, Hon EE '43
American District Telegraph Co.
Brecksville, Ohio

HUBERT L. CLARY
Elt '24, Hon EE '42
Supervisor, Motion Picture Section
Advertising Dept.
Allis-Chalmers Manufacturing Co.
Wauwatosa, Wisconsin

HENRY E. CLIFTON
EE '17, Hon EE '44
Department Chief - Inspection
Western Electric Co., Inc.
Downers Grove, Illinois

EUGENE E. CURTISS
EE '20, Hon EE '44
Superintendent of Operations
Furnas Dam
Central Electrica de Furnas
Rio de Janeiro, Brazil

WILLIAM P. GAINER
CEE '32, Hon EE '46
Engineer, Station WISN-TV
Division of Hearst Corp.
Whitefish Bay, Wisconsin

DANIEL W. GELLERUP
Elect '15, Hon EE '42
Radio and Sound
Consulting Engineer
Whitefish Bay, Wisconsin

JOHN L. GORDON
BS EEp '20, Hon EE '53
Vice-president
Central Illinois Electric & Gas Co.
Rockford, Illinois

WILLIAM A. HAIG, JR., Hon SE '31
Electrical Engineer
Naegele Outdoor Advertising Co.

K. L. HANSEN, Hon EE '38
Consulting Engineer

WALTER HARNISCHFEGER, Hon EE '54
Honorary Chairman
MSOE Board of Regents
Chairman of the Board
Harnischfeger Corporation

HANS U. HJERMSTAD
CEE '32, Hon EE '42
President
Electro-Seal Corporation
Des Plaines, Illinois

WALTER L. JAECKEL
Elect '14, Hon EE '46
Retired
Allen-Bradley Company
Fort Lauderdale, Florida

MAURICE R. JOHNSON
BS EEp '33, Hon EE '53
Plant Engineer
Ingersoll Milling Machine Company
Rockford, Illinois

GEORGE W. KNIGHT
EE '15, Hon EE '43
Foreman
Allen-Bradley Company

GROVER E. KRUECKE
Elect '20, Hon EE '46
Code Consultant
Electrical Contractors Association
Milwaukee Chapter

---

†Deceased. The Professional Electrical Engineering degree is conferred on graduates of the MSOE College of Engineering who have gained a minimum of five years of experience in their profession. The Honorary Electrical Engineering degree is conferred for distinguished professional achievements. Recipients need not be MSOE alumni.

ERIC H. LAABS, Elect '12, Hon EE '43
Retired
Cutler-Hammer, Inc.
Brookfield, Wisconsin

WILLIAM N. LAMPIRIS
Elect '17, Hon EE '46
Chairman of the Board
Electric Sales & Engineering Company
Shorewood, Wisconsin

FRED F. LOOCK, Hon EE '61
Chairman, MSOE Board of Regents
President
Allen-Bradley Company
River Hills, Wisconsin

†CHARLES R. LUND
EE '19, Hon EE '46
American Oil Company
Catonsville, Maryland

HENRY W. OSBORNE
BS EEp '30, Hon EE '53
Trafic Advisor and Engineer
Division of Safety, City of Buffalo
Buffalo, New York

RALPH J. OWEN, EE '16, Hon EE '44
Retired
The Louis Allis Company
Delafield, Wisconsin

JOHN P. PRAXEL
EE '15, Hon EE '46
Retired
Allis-Chalmers Manufacturing Co.
West Allis, Wisconsin

JAMES E. READING
Elect '20, Hon EE '53
Traffic Engineer, City of San Diego
San Diego, California

NORBERT J. RICHARD
CEE '28, Hon EE '44
Engineering Supervisor
Station WISN-TV
Division of Hearst Corp.

†PAUL H. SCHULZ
EE '10, Hon EE '43
Electrical Services
City of Milwaukee

LOYD C. SIGMON
CRaE '29, Hon EE '51
Vice-president
Golden West Broadcasters
Radio Station KMPC
Van Nuys, California

V. ROBINS TATE
BS EEp '27, Hon EE '60
Secretary, MSOE Board of Regents
Executive Vice-president
and Secretary
Perfex Corporation

†HUGH A. TRIPLETT
EE '15, Hon EE '44
Chicago, Illinois

FRANK TSCHERNITZ
EE '15, Hon EE '46
Chief Electrical Designer
Wisconsin Electric Power Co.

EDMOND F. WEBB
BS EEp '23, Hon EE '54
President
Webb Engineering Associates, Inc.
Franklin, Michigan

PETER C. WINTHER
EE '18, Hon EE '44
Supervisor, Technical Training
Vocational Dept., City of South Bend
South Bend, Indiana

ALUMNI ORGANIZATIONS

PRESIDENTS ENGINEERS' ALUMNI ASSOCIATION

†GEORGE C. GOLJENBOOM (1922)
BS EEp '20
Industrial Engineer
Allis-Chalmers Manufacturing Co.
East Troy, Wisconsin

†JOSEPH A. HAVLICK (1923)
BS EEp '21, Prof EE '52
Supervisor of Rates and Rules
Wisconsin Electric Power Co.
Shorewood, Wisconsin

FRANK P. KASPAR (1924)
BS EEp '19
Chief Substation and Transmission
Engineer
Oklahoma Gas & Electric Co.
Oklahoma City, Oklahoma

LEVI C. EDDY (1925)
BS EEp '20
Retired
Commonwealth Edison Co.
Chicago, Illinois

MATTHIAS J. MAIERS (1926)
BS EEp '20, Prof EE '38
Retired
Commonwealth Edison Co.
Western Springs, Illinois

†CHESTER C. AIKEN (1927)
BS EEp '22
RCA Victor Div.
Radio Corp. of America
Camden, New Jersey

BENEDICT A. BOVEE (1928)
BS EEp '20
Vice-president
Harper Electric Furnace Corp.
Buffalo, New York

WALDORF A. SMITH (1929)
BS EEp '21
Retired
Monroe Hardware Company
Los Angeles, California

CONRAD A. BAUER (1930)
BS EEp '24, Prof EE '41
Retired
Commonwealth Edison Co.
Sumner, Illinois

HENRY E. CLIFTON (1931)
EE '17, Hon EE '44
Dept. Chief, Inspection
Western Electric Co., Inc.
Downers Grove, Illinois

LOUIS E. SMITH (1932)
BS EEp '23
Draftsman
Lurie Glass Company

EDMOND F. WEBB (1933)
BS EEp '23, Hon EE '54
President, Webb Engineering
Associates, Inc.
Franklin, Michigan

J. WILLIAM DUHN (1934)
BS EEp '30
Sales Engineer
Bishop & Babcock Manufacturing Co.
Birmingham, Michigan

†LYMAN F. GREVE (1935)
BS EEp '21
Commonwealth Edison Co.
Chicago, Illinois

BRUNO GIAMBI (1936)
BS EEp '28
Staff Assistant, Office Div.
Commonwealth Edison Co.
Chicago, Illinois

HENRY W. OSBORNE (1937)
BS EEp '30, Hon EE '53
Traffic Advisor and Engineer
Board of Safety, City of Buffalo
Buffalo, New York

THEODORE W. BRUNER (1938)
BS EEp '34
President
Bruner Corporation

GROVER E. KRUECKE (1939)
Elect '20, Hon EE '46
Code Consultant
Electrical Contractors Association
Milwaukee Chapter

FRED J. VAN ZEELAND (1940)
BS EEp '28
Emeritus Dean
Milwaukee School of Engineering

†Deceased. Year or years in parentheses after each name is period of office. The Engineers' Alumni Association, composed of graduates of the MSOE College of Engineering, was active from 1922 to 1954 when membership was transferred to the MSOE Alumni Association. This latter group, consisting of all former students of the School, was organized on November 29, 1948, and is still active. The MSOE Associated Alumni Endowment Foundation was established in 1936 to perpetuate the institution through trust

(continued)

APPENDIX

KARL O. WERWATH (1941)
BS EEp '36
President
Milwaukee School of Engineering

EDWARD J. STACHURA (1942)
BS EEp '34
Patent Advisor
U. S. Government, Dept. of Army
Office of Chief Signal Officer
Arlington, Virginia

FRED J. VAN ZEELAND (1943)
(See EAA 1940)

†MARCY F. AYNES (1944)
BS EEp '41
Regional Manager
The Louis Allis Co.
Los Angeles, California

HUBERT L. CLARY (1945)
Elt '24, Hon EE '42
Supervisor of Motion Picture Section
Advertising Dept.
Allis-Chalmers Manufacturing Co.
Wauwatosa, Wisconsin

†EDWARD J. ROGERS (1946)
BS EEp '20
President
Layne-Northwest Co.

THEODORE W. BRUNER (1947)
(See EAA 1938)

BERNARD R. HARTOUGH (1948)
BS EEp '42
Sales Engineer
General Electric Co.
Bettendorf, Iowa

V. ROBINS TATE (1949)
BS EEp '27, Hon EE '60
Executive Vice-president
Perfex Corporation

RICHARD J. UNGRODT (1950)
BS EEp '41
Dean of Engineering
Milwaukee School of Engineering

JULIAN S. TAYLOR (1951)
BS EEp '23
Project Engineer
Allen-Bradley Company

†PAUL B. MOLSTAD (1952)
BS EEp '28
Project Engineer
Allen-Bradley Company

GLENN A. CHRISTIANS (1953)
BS EEp '49
Manager, Media Advertising
International Harvester Company
Chicago, Illinois

ROBERT W. PERRIN (1954)
BS EEe '49
Senior Reliability Group Engineer
Convair Div.
General Dynamics Corp.
San Diego, California

PRESIDENTS MSOE ALUMNI ASSOCIATION

ROY L. PINNOW (1949), EE '33
Product Engineer
Globe-Union Inc.
Wauwatosa, Wisconsin

HANS U. HJERMSTAD (1950)
CEE '32, Hon EE '42
President
Electro-Seal Corporation
Des Plaines, Illinois

FRANK P. LEDERER (1951)
BS EEp '49
Vice-president and Sales Manager
Cardinal Carryor Corp.
Louisville, Kentucky

†DONALD F. RUNNOE (1952)
BS EEe '49
Project Engineer
Marinette Paper Company
Marinette, Wisconsin

JOHN E. CARROLL (1953)
RHACT '47
Accountant
Milwaukee School of Engineering

ORSON V. HOIUM (1954)
RHACT '47
Engineer and Treasurer
Alfred Goethel Sheet Metal Works, Inc.

GROVER E. KRUECKE (1955)
(See EAA 1939)

RUSSELL W. MELANG (1956)
BS EEp '43
Sales Engineer
Allen-Bradley Company

JOHN HOELZLHAMMER, JR. (1957)
BS EEe '51
Region Engineer
Union Carbide Corporation
Aurora, Minnesota

HECTOR M. KITSCHA (1958)
BS EEp '52
Development Supervisor
Cutler-Hammer, Inc.

JULIAN S. TAYLOR (1959)
(See EAA 1951)

RICHARD B. TAIT (1960)
BS EEe '51
Supervisor, Production Engineering
AC Spark Plug Div.
General Motors Corp.
Greendale, Wisconsin

WALTER F. HUETTE (1961)
BS EEp '37
Project Engineer
Allen-Bradley Company
Waukesha, Wisconsin

KEITH D. STRUTHERS (1962)
BS EEe '55
Senior Project Engineer
AC Spark Plug Div.
General Motors Corp.

HERBERT F. VOLKMANN (1963)
BS EEp '31
Field Service Technical Writer
AC Spark Plug Div.
General Motors Corp
Wauwatosa, Wisconsin

PRESIDENTS MSOE ASSOCIATED ALUMNI ENDOWMENT FOUNDATION, INC.

†JOSEPH A. HAVLICK (1936-1941)
(See EAA 1923)

SIDNEY A. MOORE (1941-1945)
BS EEp '24, Prof EE '43
Operating Engineer
Arizona Power Authority
Phoenix, Arizona

†AARON C. BOCHER (1946-1949)
EE '13, Hon EE '46
Electrical Engineer
Herman Andrae Electrical Co.
Shorewood, Wisconsin

HOWARD L. GREUSEL (1950-1958)
BS EEp '33
Senior Project Engineer
AC Spark Plug Div.
General Motors Corp.

CHAIRMEN ALUMNI COUNSELOR PLANNING COMMITTEE

†EDWARD J. ROGERS (1945)
Founder (See EAA 1946)

THEODORE W. BRUNER (1946-1948)
(See EAA 1938)

HUBERT L. CLARY (1949-1955)
(See EAA 1945)

RUSSELL W. MELANG (1956-1963)
(See MSOE AA 1956)

funds. Since its purposes closely paralleled those of the MSOE Endowment Fund, established in 1956 as part of the School's development program, the MSOE AAEF was dissolved in 1958 and its assets transferred to the Endowment Fund. The Alumni Counselor Planning Committee was organized in 1945 by alumnus Edward J. Rogers in cooperation with President Oscar Werwath and K. L. Hansen, then Chairman of the Industrial Advisory Committee. The major purpose of the committee is the selection of MSOE Alumni Counselors and the planning of their programs.

THE MSOE DEVELOPMENT PROGRAM

FRED F. LOOCK, *General Chairman*

STEERING COMMITTEE

WALTER HARNISCHFEGER, *Chairman*

Harry G. Hoffman, *Vice-chairman*
Fred F. Loock
George C. Bitters
Harold F. Falk
Roy W. Johnson
A. C. Kieckhafer
†Edward J. Rogers
V. Robins Tate
Karl O. Werwath
Heinz M. Werwath

CHAIRMEN OF STANDING COMMITTEES

CORPORATION

Advanced Degrees and Certificates	Richard J. Ungrodt
Allen-Bradley Student Loan Fund	Harvey W. Peters
Buildings and Grounds	Harold F. Falk
Cooperation with Educational Institutions	Ralph W. Ells
Cooperation with Engineering Societies	E. C. Koerper
Faculty	V. Robins Tate
Finance	Harry L. Kunze
Foundations	Harold E. Koch
Industrial Advisory	Robert D. Teece
Judiciary	John H. Murphy
Laboratories and Equipment	Fred A. Loebel
MSOE Alumni Endowment Fund	John L. Gordon
Public Information and Development	Greta W. Murphy
Student Enrollment	Harry G. Hoffman
Student Welfare	Delmar D. Wensink
60th Anniversary Development Program	Walter Harnischfeger

STAFF

Admissions	William D. Jelinske
Commencement	Emil F. Symonik
Educational Council	Richard J. Ungrodt
Library	Donald W. Petzold
Public Relations	Greta W. Murphy
Research	Robert Stubbings
Scholarships and Loans	Arnold P. Jones

ADMINISTRATIVE COMMITTEE

KARL O. WERWATH, *Chairman*

William D. Jelinske
Harold E. Koch
Kenneth A. McAteer
Greta W. Murphy
John H. Murphy
Melvin E. Striegel
Robert Stubbings
Richard J. Ungrodt
Fred J. Van Zeeland
Hannah S. Werwath
Heinz M. Werwath

†Deceased

ADMINISTRATIVE AND ACADEMIC STAFFS

OFFICE OF THE PRESIDENT

President	Karl O. Werwath, B.S.
Secretary	Fran Millunzi

BUSINESS OFFICE

Vice-president and Treasurer	Heinz M. Werwath, B.S.
Assistant Treasurer	Hannah S. Werwath, T.C. (Mrs.)
Accountant	John E. Carroll, B.S.
Bookkeeper	Alice Ward
Cost Clerk	June Mlakar (Mrs.)
Director of Student Financial Aids, Secretary of Scholarship Committee	A. H. Broitzman, B.A.
Head, Student Financial Records and Accounts Department	Edith L. Walton (Mrs.)
Clerk-typist	Elizabeth O'Brien (Mrs.)
File Clerk	Katherine P. Hansen (Mrs.)
Manager, Book Store	Fred Andritsos
Receptionist	Margaret J. Spiering (Mrs.)

PUBLIC INFORMATION AND DEVELOPMENT

Director of Public Relations and Development	Greta W. Murphy (Mrs.)
Assistant, Editorial Services	Harry W. Stanley, B.S.
Assistant, Information Services	Vernon W. Foth, B.S.
Assistant Editor	Harry F. Bolton, B.A., M.A.
Secretary	Myrtle Abel

REGISTRAR

Registrar	Kenneth A. McAteer, B.S.
Head, Student Academic Records Dept.	Catherine C. Hughes
Clerk-typist	Phyllis E. Rigotti (Mrs.)

ADMISSIONS

Director of Admissions	William D. Jelinske, Ph.B.
Educational Counselor	Glenn Collins, B.M., M.M.
Educational Counselor	Roscoe Eades, B.S., M.A.
Educational Counselor	N. A. Werner, B.S., M.A.
Secretary	Catherine A. Gaffney (Mrs.)
Clerk-typist	Sheila B. Lederer (Mrs.)
Clerk-typist	Mary M. Muehlenkamp
Clerk-typist	Virginia Jozwiak
Receptionist	Irene Burke (Mrs.)

EVENING DIVISION

Director	Melvin E. Striegel, B.S.
Secretary	Donna M. Nygren

APPENDIX

ADMINISTRATIVE AND ACADEMIC STAFFS

RELATIONS WITH INDUSTRY

Director	Harold E. Koch, B.S., M.S.
Placement Assistant	Spencer C. Dieckhoff

ALUMNI RECORDS

Secretary	Dolores E. Marrari (Mrs.)

STUDENT AFFAIRS

Director	Earl A. Lemke, B.A.
Secretary	Viola M. Bemis (Mrs.)

LIBRARY

Librarian	Ruth K. Mitchell, B.S. (Mrs.)

INSTITUTE OF LEATHER TECHNOLOGY

Director	Robert Stubbings, B.S., Ph.D.
Chemist	Louise Ann Hoffman, B.A. (Mrs.)
Laboratory Assistant	John S. Kish
Laboratory Assistant	George D. Tomczyk
Laboratory Assistant	Elizabeth Wagner (Mrs.)
Secretary	Nancy E. Luedicke

FLUID POWER INSTITUTE

Director	Russell W. Henke, B.S., M.S., M.E.

PRODUCTION CENTER

Manager	Carl P. Hora
Addressograph Clerk	Virginia J. Janicki (Mrs.)
Addressograph Clerk	Georgiann E. Lindert
Clerk-typist	Dorothy Pontzloff
Clerk-typist	Barbara Schultze
Mail Clerk	Louis Pezzi
Printing Press Operator	Aaron J. Kolff
Printing Press Operator	Dennis G. Schallitz

BUILDINGS AND GROUNDS

Supervisor, Central Purchasing Agent	Harold E. Lowe
Laboratory Development	Charles E. Offutt, B.S.
General Maintenance	Martin V. Balodis
General Maintenance	Clarence Thoma
Custodian	Wilhelm Andersen

STOCK ROOMS

Electronics Laboratory Attendant	Andrew H. Voss
Instrument Repair Man	Peter Figielski

OFFICE OF THE DEAN

Emeritus Dean of Engineering	Fred J. Van Zeeland, B.S.
Dean of Engineering, Director of Technical Institute Programs	Richard J. Ungrodt, B.S.
Secretary, Office of the Dean	Ruth S. Boye (Mrs.)
Secretary, Allen-Bradley Hall of Science	Dona Mae Lofy (Mrs.)

ACADEMIC DEPARTMENTS

Engineering Departments

Electrical Engineering	Thomas I. Lyon, B.S. *Chairman* Joseph F. Sitzwohl, B.E.E. *Vice-chairman*
Computer Engineering Technology	David G. Haertel, B.S. *Head*
Electrical Power Engineering Technology	Ewald L. Wiedner, E.T. *Head*
Electronic Communications Engineering Technology	Richard B. Ringle, B.S. *Head*

Mechanical Engineering

	Keith F. Kummer, B.S. *Chairman*
Air Conditioning Engineering Technology	Ervin G. Stuempges, B.S. *Head*
Fluid Power Engineering Technology	Russell W. Henke, B.S., M.S., M.E. *Head*
Industrial Engineering Technology	Keith F. Kummer, B.S. *Head*
Internal Combustion Engines Engineering Technology	Joseph L. Deverse, B.S. *Head*
Metallurgical Engineering Technology	Edwin A. Meier, Jr., B.M.E. *Head*
Chemical Production Engineering Technology	Robert Stubbings, B.S., Ph.D. *Head*

Mathematics and Science Departments

Chemistry	Robert W. Brown, B.Ed., M.Ed. *Chairman*
Mathematics	Arnold P. Jones, B.A., M.A. *Chairman*
Physics	Michael C. McKay, B.S. *Acting Chairman*

General Studies Departments

	George R. Richards, B.Ed., M.Ed. *Chairman*
Economics and Industrial Commerce	George R. Richards, B.Ed., M.Ed. *Chairman*

Engineering Graphics	
English	Emil F. Symonik, B.A., M.S. *Chairman*
Humanities and Social Sciences	
Law	John H. Murphy, Ph.B., J.D. *Chairman*

FACULTY

***ROY A. ACKERMANN,** Instructor, Department of Engineering Graphics; B.S., Milwaukee School of Engineering, '63

NEIL E. AIKEN, Instructor, Department of Mathematics; B.S., Milton College, '59 (on academic leave)'

EUGENE J. ALM, Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '62

***HERMAN W. ANDACHT,** Assistant Professor, Department of English; B.S., Carroll College, '48; M.S., Marquette University, '57

JOSEPH A. BACHMANN, Assistant Instructor, Department of Mechanical Engineering; University of Wisconsin-Milwaukee

WALTER H. BIECK, Associate Professor, Department of Engineering Graphics; B.S., Milwaukee School of Engineering, '31

ROBERT W. BROWN, Assistant Professor, Department of Chemistry; B. Ed., Wisconsin State College, Whitewater, '49; M.Ed., Marquette University, '63

***FRANCIS V. CANNON, JR.,** Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '63

DONNA S. CHARRON (Mrs.), Instructor, Department of English; A.B., University of Detroit, '62

***TIMOTHY E. CLEMENTS,** Associate Professor, Department of Economics and Industrial Commerce; B.S., Marquette University, '49

***JOSEPH L. DEVERSE,** Assistant Professor, Department of Mechanical Engineering; B.S., University of Pittsburgh, '48; Registered Professional Engineer in the State of Wisconsin

***WILLIAM L. FLYNN,** Assistant Professor, Department of Economics and Industrial Commerce; B.S., Marquette University, '49

THOMAS R. GAULKE, Associate Professor, Department of Mechanical Engineering; B.S., University of Wisconsin, '43; M.S., University of Wisconsin, '50

ALBERT H. GEHM, Assistant Professor, Department of Mechanical Engineering; B.S., University of Wisconsin '56

WILLIAM H. GORIS, Assistant Professor, Department of Physics; B.S., Purdue University, '35; M.S., Purdue University, '51

***STANLEY J. GUBERUD,** Assistant Professor, Department of Mathematics; B.S., Wisconsin State College, Eau Claire, '52; M.S., Marquette University, '61

DAVID G. HAERTEL, Assistant Professor, Department of Electrical Engineering; B.S., Purdue University, '50

***MARVIN HEIFETZ,** Instructor, Department of Mechanical Engineering; B.S., University of Wisconsin, '50; Registered Professional Engineer in the State of Illinois

***RUSSELL W. HENKE,** Professor, Department of Mechanical Engineering; Director, Fluid Power Institute; B.S., University of Wisconsin, '49; M.S., University of Wisconsin, '53; M.E., University of Wisconsin, '60; Registered Professional Engineer in the State of Wisconsin

***RICHARD B. HERNDAY,** Assistant Professor, Department of Mathematics; B.Ed., Wisconsin State College, Whitewater, '52; M.S., Marquette University, '63

***JACK L. JOHNSON,** Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '62

KENNETH L. JOHNSON, Instructor, Department of Mechanical Engineering; B.S., University of Kentucky, '51; Registered Professional Engineer in the State of Wisconsin

ARNOLD P. JONES, Professor, Department of Mathematics; B.A., University of Iowa, '32; M.A., University of Iowa, '40

EDWIN F. KATZ, Assistant Professor, Department of Physics; B.S., University of Wisconsin, '41; M.S., Ohio State University, '50

MARTIN KLEIBER, Instructor, Department of Mathematics; B.S., Marquette University, '59; M.S., Marquette University, '61 (on academic leave)

RONALD A. KOBISKE, Instructor, Department of Physics; B.S., Indiana Technical College, '61; M.S., New Mexico Highlands University, '63

ROBERT J. KRUEGER, Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '59; M.S., University of Wisconsin, '63 (on academic leave)

***KEITH F. KUMMER,** Associate Professor, Department of Mechanical Engineering; B.S., University of Wisconsin, '52; Registered Professional Engineer in the State of Wisconsin

MARTIN T. LAWLER, Instructor, Department of Physics; B.S., Milwaukee School of Engineering, '61 (on academic leave)

***FRANCIS J. LOFY,** Assistant Professor, Department of Electrical Engineering; B.E.E., Marquette University, '55

---

*Evening Division also

APPENDIX

THOMAS I. LYON, Associate Professor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '54

***KARL MAIER,** Instructor, Department of Mathematics; B.S., Ped. Inst., Odessa, Russia, '33; B.S., Ped. Inst., Nikolajew, Russia, '40

***MICHAEL C. McKAY,** Instructor, Department of Physics; B.S., Milwaukee School of Engineering, '60

JAMES E. MECCA, Instructor, Department of Physics; B.S., Milwaukee School of Engineering, '59

***EDWIN A. MEIER, JR.,** Assistant Professor, Department of Mechanical Engineering; B.M.E., Marquette University, '57; M.S., University of Wisconsin, '63; Registered Professional Engineer in the State of Wisconsin

AUSTIN R. MLADA, Instructor, Department of English; B.S., University of Wisconsin, '51

***GEORGE A. MORRISON,** Associate Professor, Department of Mathematics; B.S. Marquette University, '57; M.S., Marquette University, '61

JOHN H. MURPHY, Professor, Department of Law; Ph.B., Marquette University, '31; J.D., Marquette University, '34

***WILLIAM J. NYBACK,** Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '59

HAROLD T. ODEGAARD, Instructor, Department of Mechanical Engineering; B.S., University of Minnesota, '20

ROBERT E. OLSON, Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '62

WILLIAM L. OLSON, Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '62

***DAVID W. PETTY,** Instructor, Department of Mathematics; B.S., Mount Union College, '59

***DONALD W. PETZOLD,** Assistant Professor, Department of Electrical Engineering; B.S., University of Wisconsin, '50

JAMES J. PHILBERT, Assistant Instructor, Department of Electrical Engineering; A.A.S., Milwaukee School of Engineering, '59

***GEORGE E. RAUE,** Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '61

ROBERT E. RICE, Associate Professor, Department of Mathematics; B.S., Wisconsin State College, Eau Claire, '51; M.S., Marquette University, '58

***GEORGE R. RICHARDS,** Professor, Department of General Studies; B.Ed., Wisconsin State College, Whitewater, '36; M.Ed., Marquette University, '50

LEWIS A. RILEY, Instructor, Department of Chemistry, B.S., Marquette University, '47

***RICHARD B. RINGLE,** Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '59

***ANDREW B. SCHMIRLER,** Instructor, Department of Mathematics; B.S., St. Norbert College, '57

HARRY G. SHOLES, Associate Professor, Department of Chemistry; B.A., University of Wisconsin, '15 (medical leave)

***JOSEPH F. SITZWOHL,** Associate Professor, Department of Electrical Engineering; B.E.E., Marquette University, '49

***JOHN T. SNEDEKER, JR.,** Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '59

BROOKS STEVENS, Industrial Design Lecturer, Department of Engineering Graphics; Industrial Designer, Brooks Stevens Associates

ROBERT STUBBINGS, Professor, Department of Chemistry; Director, Institute of Leather Technology; Ph.D., Lehigh University, '49

***ERVIN G. STUEMPGES,** Instructor, Department of Mechanical Engineering; B.S., Milwaukee School of Engineering, '61

***EMIL F. SYMONIK,** Professor, Department of English; B.S., Wisconsin State College, Milwaukee, '44; M.S., Wisconsin State College, Milwaukee, '56

***CHARLES J. TUR,** Instructor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '62

RICHARD J. UNGRODT, Professor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '41

FRED J. VAN ZEELAND, Professor, Department of Electrical Engineering; B.S., Milwaukee School of Engineering, '28; Registered Professional Engineer in the State of Wisconsin

***JAMES A. VOGTSBERGER,** Instructor, Department of Engineering Graphics; B.S., Stout State College, '58

GERALD A. WAHMHOFF, Instructor, Department of Humanities and Social Sciences; A.B., Aquinas College, '59; M.A., Marquette University, '63

RONALD L. WALLING, Instructor, Department of Chemistry; B.S. Ch.E., Illinois Institute of Technology, '63

***HERBERT D. WERWATH,** Instructor, Department of Electrical Engineering; M. Elect., Milwaukee School of Engineering, '33

RALPH H. WEY, Instructor, Department of Electrical Engineering; B.S., University of Wisconsin, '48; Registered Professional Engineer in the State of Wisconsin

EWALD L. WIEDNER, Associate Professor, Department of Electrical Engineering; E.T., Milwaukee School of Engineering, '24

---

*Evening Division also

***CHARLES WILSON, JR.**, Instructor, Department of Mechanical Engineering; B.A., Gen. Washington College, '41; B.A., Ohio State University, '49

WILLIAM C. WINN, Instructor, Department of Electrical Engineering; B.S., Central College, '35 (on leave)

CHARLES E. YOUNG, Professor, Department of English; A.B., Harvard University, '02; A.M., University of Wisconsin, '08; Ph.D., University of Wisconsin, '12

EVENING DIVISION ONLY

JOHN J. BARTOLETTI, Manager, Engineering Specifications Dept., Johnson Service Co., B.S., University of Illinois, '53; M.S., University of Illinois, '56; M.S., University of Wisconsin, '62 (Metallurgy Program)

JOSEPH A. BEADY, Research Electrical Engineer (Sr.), A. O. Smith Corp.; B.S., Milwaukee School of Engineering, '49 (Industrial Electronics Program)

AARON BELONGIA, Claims Attorney, Hardware Mutual Insurance Co., B.A., St. Norbert College, '53; L.L.B., Marquette University, '56; (Industrial Relations Program)

HARVEY W. CASTELAZ, Superintendent, Utilities Refrigeration and Air Conditioning, Jos. Schlitz Brewing Co.; RHACT, Milwaukee School of Engineering, '47 (Refrigeration, Heating, Air Conditioning Program)

DONALD K. DAVIS, Manufacturer's Representative, Schroeder Bros. Corp.; B.S., AeE., Wayne State University, '34 (Fluid Power Program)

LEROY A. DAVIS, TV Service Representative, RCA Service Co., Inc.; Marquette University (Audio-Radio-Television Program)

WILLIAM G. DOUGLAS, Laboratory Supervisor, The Oilgear Company (Fluid Power Program)

GEORGE S. GURCHINOFF, Administrative Assistant, AC Spark Plug Div., General Motors Corp.; B.S., Northern Michigan College, '51 (Mathematics)

ALLAN E. HEINRICH, Project Engineer, The Dynex Company; B.S. University of Wisconsin, '52; Registered Professional Engineer in the State of Wisconsin (Fluid Power Program)

EMMANUEL J. IRVING, Electronic Engineer, AC Spark Plug Div., General Motors Corp.; EE, Milwaukee School of Engineering, '32 (Audio-Radio-Television Program)

ARNOLD E. JAKEL, Quality Control Consultant; B.S., United States Naval Academy, '38; M.S., Massachusetts Institute of Technology, '44 (Industrial Engineering Program)

THOMAS F. KASTELLO, Consulting Engineer; B.S., University of Wisconsin, '49; M.S., University of Wisconsin, '50 (Refrigeration, Heating, Air Conditioning Program)

KENNETH E. KRUTSCH, Supervisor of Industrial Engineering Training; A. O. Smith Corp.; B.S., Northwestern University, '41 (Industrial Engineering Program)

WALTER W. LEHNHOFF, Staff Engineer, Allen-Bradley Company; B.S., University of Wisconsin, '50; M.S., University of Wisconsin, '55; (Industrial Electrical Power Program)

PAUL K. LINDQUIST, Maintenance Department, Mayfair Shopping Center; Lincoln Electric Welding School (Welding Program)

ARTHUR W. McCONNELL, Instructor, Field Service Engineering, AC Spark Plug Div., General Motors Corp.; B.S., Milwaukee School of Engineering, '60 (Industrial Electronics Program)

RALPH A. NODWELL, JR., Zone Owner Relations Representative, Chevrolet Motor Div., General Motors Corp.; Milwaukee School of Engineering (Internal Combustion Engines Program)

JOHN H. SCHMIDT, Senior Project Engineer, AC Spark Plug Div., General Motors Corp.; B.S., Illinois Institute of Technology, '46; Registered Professional Engineer in the State of Wisconsin (Mathematics)

JAMES E. SLAGG, Project Engineer, Allen-Bradley Company; B.S., University of Wisconsin, '49 (Industrial Electrical Power Program)

C. CREIGHTON STEVEN, Production Manager, Goodwill Industries of Wisconsin; B.B.A., University of Wisconsin, '49 (Industrial Engineering Program)

FRANK R. STRANG, Manager, Factory Cost Control, The Louis Allis Co.; B.S., Antioch College, '53; M.S., Carnegie Institute of Technology, '58 (Operations Research Program)

JOHN M. SVOBODA, Foundry Metallurgical Engineer, Falk Corp.; B.S., University of Wisconsin, '60 (Metals Program)

RICHARD F. THUMA, Chief Maintenance Engineer, Allis-Chalmers Mfg. Co.; B.S., University of Arizona, '36 (Industrial Engineering Program)

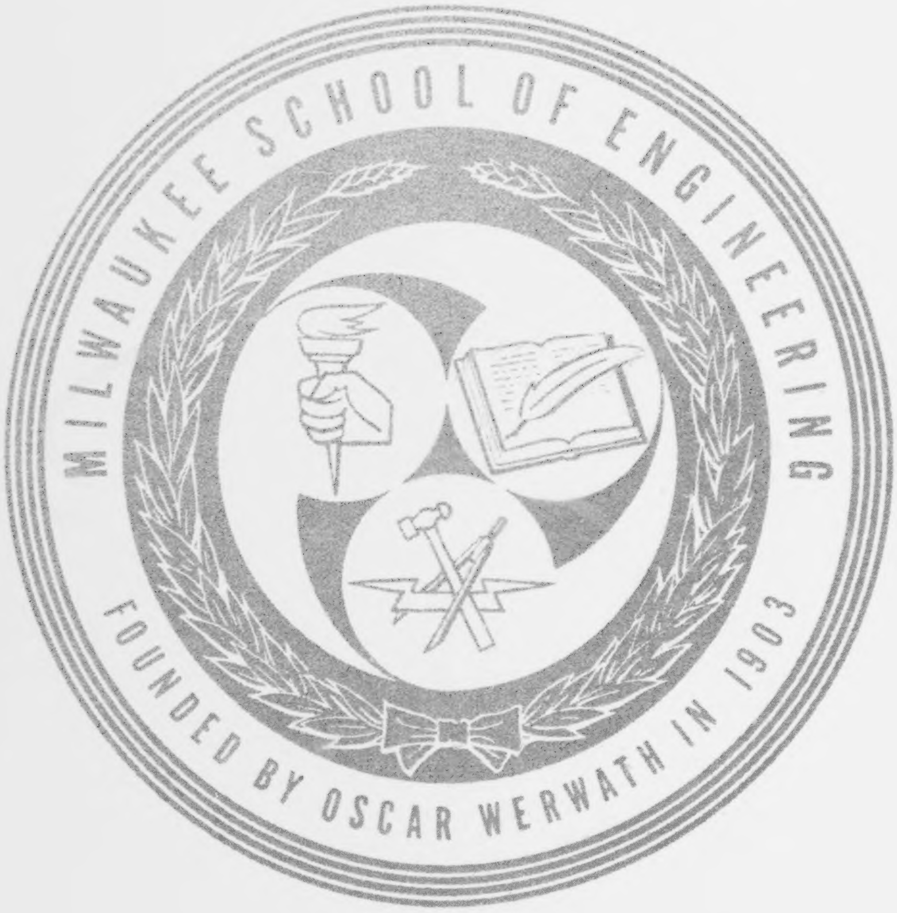
PETER L. TOCUPS, Project Engineer, AC Spark Plug Div., General Motors Corp.; B.S., Milwaukee School of Engineering, '58 (Industrial Electronics Program)

RAYMOND E. YOUNG, Project Engineer, AC Spark Plug Div., General Motors Corp.; B.S., Milwaukee School of Engineering, '57 (Industrial Electronics Program)

RALPH J. ZYNIECKI, Sales Engineer, Crichton Corp.; RHACT, Milwaukee School of Engineering, '51 (Refrigeration, Heating, Air Conditioning Program)

---

*Evening Division also


MILWAUKEE SCHOOL OF ENGINEERING
FOUNDED BY OSCAR WERWATH IN 1903

Health enough to make your work a pleasure
Wealth enough to support your needs
Strength to battle with difficulties and overcome them
Patience enough to toil until some good is accomplished
Charity enough to see the good in your neighbor
Love enough to move you to be useful
and helpful to others
Faith enough to make real the things of God
Hope enough to remove all anxious fears
concerning the future

This epilogue is an adaptation of the philosophy of Johann Wolfgang Von Goethe as interpreted and lived by the founder of the Milwaukee School of Engineering, Oscar Werwath.

DO NOT FILM THIS PAGE

MSOE

MILWAUKEE SCHOOL OF ENGINEERING
1025 North Milwaukee Street • Milwaukee 1, Wisconsin
Founded 1903 • 60th Anniversary Year